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NEWLANDS-BROUSSARD-RAINEY RIVER REGULATION BILL

HEARINGS

BEFORE THE

COMMITTEE ON FLOOD CONTROL

HOUSE OF REPRESENTATIVES

SIXTY-FOURTH CONGRESS

FIRST SESSION

ON

H. R. 13975

A BILL TO PROVIDE FOR FLOOD PREVENTION AND MITIGATION, AND FOR THE STORAGE OF FLOOD WATERS, AND FOR THEIR BENEFICIAL USE FOR IRRIGATION AND WATER POWER, AND FOR THE CONTROL OF FLOOD WATERS IN THE RECLAMATION OF OVERFLOW LANDS, AND FOR OTHER PURPOSES

MARCH 31, APRIL 1, 2, AND 4, 1916



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NEWLANDS-BROUSSARD-RAINEY RIVER REGULATION BILL.

COMMITTEE ON FLOOD CONTROL,
HOUSE OF REPRESENTATIVES,
Friday, March 31, 1916.

The committee met at 10 o'clock a. m., Hon. Benjamin G. Humphreys (chairman) presiding.

The CHAIRMAN. Mr. Rainey, you may proceed.

STATEMENT OF HON. HENRY T. RAINNEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS.

MR. RAINNEY. Mr. Chairman, I regard the work of this committee as being of tremendous importance, and I know something about what the committee has started out to do. In view of the fact that the river and harbor bills are failing in the Senate and may fail soon in the House; in view of the fact that the Senate and the House are absolutely deadlocked on the question of water power, one of the most valuable assets in our rivers, the most valuable asset remaining to the Government, both in navigable and nonnavigable rivers; in view of the fact that we have only two national assets that are of any value upon which we can hope for possible national revenues in the future, to wit, the declivities in our rivers, where power sites are, and the nitrogen which surrounds the earth; in view of the fact that power groups are reaching out now to take possession of power sites in our rivers, and the intrinsic values of our rivers in this particular, and are also trying to monopolize the nitrogen in the air, which they can only do by controlling the more important power sites, I regard this committee as having been created at a psychological moment. I think the work you are going to do in the future—in the next 10 years—will be the most important work in this country.

Knowing what you have started out to do, I have taken the liberty to introduce in the House the bill known as the Newlands bill. I do not have any pride of authorship in the bill. I did not write a line of it, but because it attempts to reach the things you are trying to reach, I have introduced it so that you may have it before you for your consideration in framing the very important bill I know you expect to frame.

This morning we have with us the greatest hydraulic engineer in the world; the man who knows the most about the water-power problems in this country, so far as the Mississippi River and all other rivers are concerned, and who can qualify as no other hydraulic engineer can qualify, and who can discuss, in a most interesting man-

ner the value of water as a national asset. I hope that when he commences his address he will overcome his natural modesty and tell the committee what he has accomplished during the years of his useful career.

I am going to ask Senator Newlands to introduce Mr. Lyman E. Cooley.

**STATEMENT OF HON. FRANCIS G. NEWLANDS, UNITED STATES
SENATOR FROM THE STATE OF NEVADA.**

Senator NEWLANDS. Mr. Chairman, I wish to say—by way of introduction—a few words regarding the history of the bill to which Mr. Rainey has just referred.

It is quite a long history. It was originally introduced some seven or eight years ago. Subsequently Mr. Bartholdt, of St. Louis, having read it, concluded that it met all the requirements of the region which he represented, and, without consultation with me, or without my suggestion, he introduced a similar bill in the House. I was very glad to have his concurrence and support.

Later on, Mr. Broussard, when he was a Member of the House, was desirous of embodying in that bill some of the general provisions of the Ransdell-Humphreys bill, and of making the bill apply more specifically to the Mississippi Valley, and, after a conference with me, introduced a bill in the House, which was afterwards known as the Newlands-Broussard river regulation bill.

Mr. Broussard later on went to the Senate. Recently Mr. Rainey has reintroduced the bill in the House. I am very glad it has received his support.

Now, Mr. Chairman, I wish to say generally, in reference to this bill, that my attention was first called to the comprehensive development of the waterways during the agitation regarding the irrigation of arid lands. I was then a Member of the House, and that agitation went on for about 10 years before it ripened into legislation. A bill was finally passed, now known as the United States reclamation act, which provided a permanent revolving fund for the reclamation of arid lands. The appropriation which that bill has provided amounts to about \$80,000,000. The reclamation act is working very satisfactorily, and great beneficial results have been accomplished under it.

During that period my attention was called to the larger problem of a national policy for river regulation, although I represented a State that had no navigable rivers in it, but it is partially drained by the Colorado River.

Mr. Roosevelt became very much interested in this question, and, during the latter part of his administration, he appointed a waterways commission, known as the Inland Waterways Commission, consisting of two Senators, two Representatives, and the chiefs of the various scientific services of the Government that had anything whatever to do with water, such as the Corps of Engineers of the Army, the Reclamation Service, the Forestry Service, the Geological Survey, and other bureaus and services.

This was simply an executive commission, without any authority of Congress, appointed by the President in aid of his power of

recommendation. He wished us to make a thorough investigation of this whole subject and to report to him in order that he might make his recommendations to Congress.

We did make a very thorough survey of the various waters of the country—in the North, in the South, in the East, and in the West.

Before the commission was prepared to make its report, I had come to some conclusions regarding the matter, and I thought I would embody those conclusions in a bill, which I introduced about 1906. The principles of that bill were substantially indorsed by the entire membership of the Inland Waterways Commission, including Mr. Burton, of Ohio, who was the chairman of the commission.

We made our recommendations to Mr. Roosevelt, and he adopted those recommendations with a vigorous message to Congress. Unfortunately, he got into trouble with his own party toward the close of his administration, and he was unable to unite the party upon any measure.

In the Senate he relied upon me particularly to press the measure which I had in view and with which he thoroughly sympathized. He had correspondence with me about the subject. While some features of the bill were favored in the Senate at that time, consideration was blocked by two of the very powerful leaders of Mr. Roosevelt's own party, who were opposed to the general conservation program.

During Mr. Roosevelt's administration that bill, which is this bill, quite materially enlarged, however, but embracing all the essential principles of the former bill, received the favorable report of Mr. Taft as Secretary of War. He approved every feature of it, the principle of the coordination of the scientific services of the Government in a commission, the cooperation of the Nation with the States in the comprehensive treatment of waterways, from the sources of the waterways to their mouths, and the creation of an ample fund for continuous work.

With your permission I will put into the record extracts from a report of the Senate Committee on Commerce (Rept. No. 1339, 62d Cong., 3d sess.) containing indorsements of the river-regulation bill from many sources, including the resolution of the conference of governors upon this subject, some reference to the report of Mr. Taft, and some of Mr. Roosevelt's declarations in reference to the matter.

The CHAIRMAN. If you will file those, we will be very glad to put them in the record.

Senator NEWLANDS. I will do that.

(The document submitted by Senator Newlands is Senate Rept. No. 1339, 62d Cong., 3d sess. The subject matter of it is found also in the Congressional Record, Senate proceedings, Feb. 20, 21, 22, and 24, and Mar. 1, 1913. It is not reprinted here.)

Senator NEWLANDS. Every session since the session of 1912-13, when that report from the Committee on Commerce of the Senate was made and the river-regulation amendment adopted in the Senate, I have introduced that bill in the Senate of the United States, and I have discussed it frequently, availing myself of every opportunity to do so, but not being disposed to press it to final action until the public opinion of the Senate and of Congress would sanction the creation of a very large fund sufficient for continuous work.

The plan of this bill contemplated the setting aside in a waterway fund \$60,000,000 annually for a period of 10 years, and the appropriation of that fund to the development of waterways in certain water districts.

The first district was the Appalachian, Atlantic, and Gulf district, which embraced the watersheds of all rivers emptying into the Atlantic Ocean or into the Gulf east of the drainage basin of the Mississippi River, and that district received \$5,000,000 annually for 10 years. The second district comprised the entire drainage basin of the Ohio River, and received \$10,000,000 annually for 10 years. The third district comprised all the territory draining into the Great Lakes and the drainage basin of the Red River in North Dakota and the upper Mississippi River, and received \$5,000,000 a year for 10 years. The fourth district comprised the Mississippi River from St. Louis to the Gulf, including the Atchafalaya River, and received \$10,000,000 annually for 10 years. The fifth district comprised the drainage basins of the Missouri River and of all rivers emptying into the Gulf west of the Atchafalaya River, and received \$10,000,000 annually for 10 years. The sixth district included the drainage basin of the Columbia and Snake Rivers and Pacific drainage in Oregon and Washington, and received \$5,000,000 annually for 10 years. The seventh district comprised the Great Inland Basin and the Colorado River drainage basin, and received \$5,000,000 annually for 10 years. The eighth district comprised all watersheds draining into the Pacific Ocean in California, and received \$5,000,000 annually for 10 years.

The purpose of this general division into watershed districts was to insure every watershed in the country a fair deal in the constructive work provided for by this bill and to insure continuous work upon the projects and contemporaneous work, so far as was practicable.

We had observed in the campaign for the United States reclamation act that there was great reluctance upon the part of each of the 17 States involved in that scheme to concede to any other State a right of way, and so we provided in that bill that the work should proceed, as far as practicable, contemporaneously in each of the States covered by the bill, and that temporarily the moneys belonging to one State could be applied to works that were more advanced, so far as their plans were concerned, in other States, and we finally brought about an adjustment among all the opposing forces upon that bill in that way, and it was thought that some such provision in this bill might bring into cooperation in a general scheme the representatives of States and watersheds whose plans as yet were not fully advanced.

Both the Democratic and Republican platforms have called for a very complete and comprehensive treatment of the rivers of the country, and the Democratic Party has been particularly explicit in its platforms; both the platform of 1908 and the platform of 1912 are clear in that regard. Those platforms cover specifically the provisions of this bill, providing for the coordination of the scientific services of the Government through a coordinating commission, cooperation with the States in plans and works and costs and benefits, an ample fund for the prosecution of the work, and involving not only the development of the rivers for navigation but for their col-

lateral purposes, the mitigation of floods, the irrigation of arid lands above, the reclamation of swamp lands below, and the intermediate development of water power, the reforestation of denuded areas, and the promotion of intensive cultivation in the humid region itself through the storage and application of flood water.

You may ask how is it that this bill has not reached a greater advance in legislation. My answer is that the bill itself, in its very terms, is largely educational. It is much fuller, possibly, in its phraseology than an ordinary legislative act would be, because it was expected that the bill itself would constitute an important factor in the propaganda of this movement, and it has had that effect.

The bill has been indorsed by a number of States, including States as widely separated as Louisiana and Wisconsin and South Dakota. It has received the approval of the waterways organizations of the Pacific coast and numerous other commercial and of the waterway associations of the South and of the Middle States and of the States on the eastern coast, including boards of trade and chambers of commerce. It received the approval of the Irrigation Congress and its principles received the approval of Mr. Wilson in a telegram addressed to the Irrigation Congress, at Salt Lake City, in which he declared himself to be quite in sympathy with the purposes of that Congress, and favored a policy which would promote the development of waterways for every useful purpose, and thus turn, as he happily expressed it, floods from a menace into a blessing.

This bill has also had the consideration of an interdepartmental committee, consisting of the Secretaries of War, Agriculture, Interior, and Commerce, during Mr. Wilson's administration. That committee first took up the bill some two years or more ago and went over it very laboriously, and three of the members of that committee were enthusiastically in favor of the general principles of the bill. The Secretary of War was more conservative. I think he, perhaps, reflected in a degree the very conservative views of the Engineer Corps of the United States Army, which has always protested against any possible invasion of its supposed jurisdiction. I want to say that the jurisdiction of the Engineer Corps of the United States Army is not affected by this bill. It will still have control over channel development, bank revetment, and levee building, but there are other features of the bill, such as the irrigation of arid lands, the reclamation of swamp lands, the promotion of water power, that may possibly come under other engineering services.

A report upon that matter was made to the President of the United States, through this interdepartmental committee, and their report, I may say, was backed up by a report from the services committee, consisting of representatives of all the scientific services of the Government included in the bill. The only dissenter to that report was the Engineer Corps of the Army, the others recommending the substantial features of this bill.

The complications abroad and with Mexico came up and the President did not feel that he would be warranted in pressing upon Congress the consideration of any such large appropriation as this bill called for, but he was entirely willing to support the coordinating organization provided for in the bill, and so informed me. I told

him that I thought we had made so many failures in our river work, through our failure to secure an ample fund for continuous work, that I did not feel like risking the bill unless it was accompanied by a fund that would provide for consecutive work for a period of at least 10 years. So I concluded not to accept the suggestion and press a more moderate measure, which cover simply the organization of the coordination and the cooperation, with a moderate appropriation for surveys and investigations.

The matter has come up again recently, as the result of a telegram from the New Orleans Chamber of Commerce to the President of the United States, urging the consideration of this question and the redemption of the pledges of the Democratic platform, and urging particularly the adoption of this bill, naming it.

As a result of that urgent communication, sent at a time when floods were threatening that entire region, the interdepartmental committee was called together again, and they had a conference with Senator Ransdell, Senator Broussard, and myself—Mr. Humphreys unfortunately being prevented by illness from attending the conference—and they unanimously agreed to recommend the organization under this bill, and appropriations for specific projects, such as the lower Mississippi River, whose plans were finally and conclusively made, and an additional appropriation for surveys, investigations, plans, and so forth.

I felt that under the circumstances, and considering the financial condition of the country, it would be best, so far as the measure I had been pressing was concerned, to accept that recommendation, although I declined it two years before, insisting that the only way to satisfactorily solve this question was to frankly recognize its magnitude and provide for it by the creation of an ample fund, and, if necessary, to resort to additional taxation in order to create the fund.

I want to say with reference to the magnitude of the project contemplated by this bill that while it appears large, it is not large as compared with other great enterprises. The railroads of the country contemplate with entire equanimity an expenditure of a billion dollars annually, and this bill only provides for an expenditure of \$600,000,000 in 10 years.

Mr. Hill, of the Great Northern Railroad Co., declared that in five years the railroads would be called upon to make expenditures on our railroads of \$5,000,000,000, or \$1,000,000,000 annually, and, of course, the people practically pay the interest upon that money through the payment of rates, just as they will be called upon to pay the interest on other money to be expended for governmental purposes through their taxes. One is just as onerous upon the people as the other, and there is hardly any distinction between rates and taxes, so far as popular opinion is concerned. I do not see why a great Government should not be able to take as big a view of a big thing, just as big a view as is taken by a single individual like Mr. Hill.

I am in hopes that before we get through with this matter we will conclude, with the cooperation of the President, to enlarge the area of the appropriation very materially, but I have not felt like holding out continuously against any modification of the bill.

I am afraid, Mr. Chairman, that I have taken up too much of your time, but there is quite an ample history of this subject which I thought it might be well to develop at the start.

I am very glad to introduce to the committee Mr. Lyman E. Cooley, whose acquaintance I made some four or five years ago, when I was a member of the Committee on Commerce of the Senate, upon an occasion when he made one of the most luminous statements I have ever heard upon the waterways question. I think we are very fortunate in having him present here to-day.

(Mr. Lyman E. Cooley, a civil engineer of Chicago, addressed the committee. The manuscript of his remarks was sent to him for revision, but has not been returned because of serious illness in his family. His speech will be printed hereafter.)

COMMITTEE ON FLOOD CONTROL,
HOUSE OF REPRESENTATIVES,
Saturday, April 1, 1916.

The committee met at 10 o'clock a. m.

Present: Representatives Humphreys of Mississippi (chairman), Foster, Cline, Russell, Vinson, Wilson, Curry, Husted, Wood, and Martin.

The CHAIRMAN. Mr. Rainey, will you proceed? The other members of the committee will shortly be here.

Mr. RAINEY. I desire to present Mr. George H. Maxwell to the committee.

STATEMENT OF MR. GEORGE H. MAXWELL, EXECUTIVE DIRECTOR NATIONAL RECLAMATION ASSOCIATION, WASHINGTON, D. C.

Mr. MAXWELL. Mr. Chairman and gentlemen of the committee, for more than 20 years I have contended that the constitutional power of the Federal Government to enter upon the work of flood control is not necessarily limited by the commerce clause of the Constitution.

When we take into consideration the enormously large areas of the earth's surface, like northern Africa, Asia Minor, Mesopotamia, and the immense areas in Arabia, Palestine, Persia, and other parts of Asia that have been entirely destroyed by the failure of the people to control and conserve the resources of nature, it becomes plain that it is just as much the duty of the Federal Government to do the things that are necessary to protect our country from destruction in this manner by the invasion of nature's destroying forces as it is to protect it from the invasion of a foreign enemy.

I mention that merely in order that you will all understand that in undertaking to tie everything that we are asking the Government at this time to do for river regulation to the navigation clause of the Constitution we do not by any means take the position that it must necessarily be so connected. At the same time there is no doubt of the fact that the great majority of the people of the United States have been bred for years to the belief that unless a plan for flood control is a part of a broader plan for the improvement of naviga-

tion that the National Government has no control over the matter. For that reason I apprehend that if through the efforts of this committee a bill is presented to the Congress taking up the matter of flood control for the protection of one section of the country only, that as soon as it is generally understood in all parts of the United States that the Government has undertaken that work of flood control there will be a perfect stampede of claimants for protection of that kind from all over the country. For that reason it would be exceedingly unwise to undertake to pass a measure at this time which would limit the benefits from this action of the Government to any one section.

I speak of that not because I do not fully appreciate the ultimate needs and the immediate needs of the lower Mississippi River, but merely as a word possibly of caution which may result in avoiding the loosening of the stone that would start an avalanche of opposition and make an interminable amount of controversy on the subject at this session of Congress.

I think that the great mass of the people of all sections of the country who are interested in flood protection are willing that the lower Mississippi Valley should have precedence, but if all other sections should be entirely ignored I question very much whether a measure of that character would not arouse very great opposition. In all the West, and in the Ohio Valley, where the movement has crystallized behind what is known as the Newlands-Broussard river-regulation bill, which was originally inaugurated by the Flood Commission of Pittsburgh—the bill being printed in full in their report—the people have been led to believe that that bill provides for all sections of the country, and they will understand, if a bill along those general lines is passed, that all sections of the country have been considered and will be taken care of ultimately.

In the consideration of the different questions involved in connection with this proposed legislation, the Mississippi River is so overshadowing in its magnitude, in comparison with any other section of the country, that I want to say a few words about the other sections first, because I know if I get into the discussion of the Mississippi River I will never get back to anything else.

In the first place, with reference to the Colorado River: From the standpoint of urgency, or immediate construction—not investigations, but immediate construction—in so far as investigations are concerned, and in so far as knowledge of the facts is concerned, the Colorado River is a more completely surveyed and investigated problem than the Mississippi River, because the elements that control it are much more capable of absolute knowledge, without the necessity for knowing the underground conditions or making investigations that would have to be made with reference to the underground strata.

The condition on the Colorado River is this:

The river once broke through into the Imperial Valley, because of taking a chance which very likely the people of the valley should not have taken, cutting an inlet in order to help the intake of their canal, without properly controlling it, with the result that if it had not been stopped finally the whole Colorado River would have gone into that valley, and one of the most fertile regions of the whole

United States would have been completely destroyed and covered with a flood which could not have been drained off.

I ask the particular attention of the committee to that point with reference to the Imperial Valley, for this reason: All through the Mississippi Valley, if the flood gets over the levees and fills up the basins, they drain off into the Gulf of Mexico, but the Imperial Valley has no outlet. It runs down to a point at least 100 feet below sea level, with no outlet, so that if the river should ever break through and fill the basin, as it was undoubtedly at one time naturally filled, it would be for all time lost to us until the sun had evaporated the flood which had filled the basin in that way. The water that went in from the last break will never go out until it evaporates; that is the only way it can get out.

The flood of last winter went to within 18 inches of the top of the sill at the Hanlon head. If it had not been for the fact that the levees went all to pieces on the Arizona side it would have gone over the protection works on the California side, and no man could foresee what the results might have been.

The Colorado River is one of the most treacherous and unruly rivers in the world. When you think of a distance of only 18 inches between the level of a flood and the top of the sill at the heading, and then bear in mind that there were waves in that river at the time of that flood that were 20 feet high at Yuma, you can get some idea of the possibilities of damage from such a flood in the Colorado River.

That is why I say that when it is understood that this committee is dealing with this question in a broad, constructive way, the people of the Southwest are going to feel that if it comes to a question of emergency, that their necessities are in some respects really more acute than the necessities of the lower Mississippi Valley.

Again, take it in southern California. The flood of two years ago carried 4,000,000 cubic yards of silt into the Los Angeles Harbor, and the flood of last year a very large amount—I have not the exact figures; I do not think it has been accurately estimated yet.

Within less than two years, if ample funds were provided, those floods could be controlled in the mountain watersheds, and in the intervening valley so as to practically minimize the danger of sediment going into the harbor and very largely do away with the necessity for building the dyke. They are proposing to build what is known as the Dominguez Dyke, merely to change the mouth of the river and construct a temporary safeguard against the silt going into the harbor. Of course, it should be built at once, unless the watershed work can be done immediately and comprehensively.

The people of Los Angeles County are proposing a bond issue of about \$3,000,000, which is as much as they think they can carry at the present time, for the purpose of doing the local work necessary to keep that flood from doing damage and to keep the silt from being brought down. If the National Government at this time would co-operate, even to the extent of no more than the county is willing to do, and let it be done immediately, it would save the Government a danger there which is imminent and acute and of enormous proportions, and so far as flood control and flood damage are concerned, the way a flood rips and tears through the highly improved orange

groves and homes of southern California is something beyond any comparison with the overflow of the lower Mississippi Valley, except in the more highly improved localities. Of course, every one acquainted with southern California appreciates that fact.

You go into the San Joaquin Valley, and you have this condition: Some years ago the Army engineers built what is known as the "Stockton Cut-Off Canal," the idea being that by carrying the water around one side of Stockton through a canal that it would prevent from filling up with silt what is known as the "Stockton Channel," and in that way aid navigation. The Army engineers made a mistake. The fall of the canal was not sufficient to carry the sediment, and during the first big flood it filled up. The levee was built on the Stockton side, because the purpose of the structure had really been to protect Stockton from floods. The result was the flood went out on a very large area on the other side which had never before been flooded, and those people have filed claims against the Government for something like \$400,000, caused by the building of a canal which was built primarily to protect Stockton from floods.

There was a reservoir site inside of the foothill country known as the Calaveras Reservoir, which could have been built and which would have entirely prevented the flood, and which would have prevented the damage which was being done by the washing away of the farm lands in the valley, and those people who are now subject to that damage caused by the canal built by the United States are subject to it at any moment; any big flood that comes may do them \$400,000 more of damage. The amount which is necessary to build the Calaveras Reservoir and entirely obviate that is a very small amount, comparatively, I mean. A million dollars would put that situation in good shape.

In the San Joaquin Valley, in the lower part of the valley, we have the problem of Dulare Lake, a vast agricultural section, one of the richest in the world, which is subject to overflow completely in the wet years by the floods from Kings River. Of course, we hope in the course of the future years that reservoirs and high-line canals will control those floods, but it will be a long period of time before that is accomplished. Those people are in exactly the same condition as the people in the lower Mississippi Valley, and when I say the "lower Mississippi Valley" I mean from Cairo down; and I think they may justly claim that when it comes to a consideration of emergencies that their case should be considered.

I want to make it clear, Mr. Chairman, that in these cases there is no necessity for a further investigation. The exact conditions are known. There is not anything in the world necessary except to go and do certain things. If, in the case of the Colorado River, the appropriation were turned over to the Reclamation Service, they could go right ahead with the work and complete it within a year. In southern California the work should be done, I think, through the Forest Service. If the money were turned over to the Forest Service, and these check dams which have been accepted as the solution of this problem were built there by the Forest Service, or the Reclamation Service, everything needed for the work is right there, and they know exactly what to do to-morrow if they had the money to proceed with construction.

The Calaveras Reservoir site has been surveyed, cost, capacity, and everything is known, and the Reclamation Service could have that reservoir completed in less than two years.

So far as the drainage canal through the San Joaquin Valley is concerned, and drainage of the Tulare Lake country, and which would be an outlet for the waters that should be drained out from the orchards and vineyards in that country, where there is no proper drainage facilities, that could be built without any delay at all for surveys or investigations. The complete knowledge necessary upon which to base construction could be taken right from existing maps and data on file in the departments.

The CHAIRMAN. By whom were these investigations and surveys made?

Mr. MAXWELL. By the United States Government—the Reclamation Service and the Geological Survey. The Geological Survey has completed their topographic maps of the San Joaquin Valley, so that the levels are entirely known; in fact, they have been at work for nearly 15 years perfecting those maps.

The work in southern California that is needed to be done so promptly is simply building what is known in that country as “check dams,” little dams that completely check the velocity of the torrent coming down the canyon, and in that way prevents the torrent from bringing down in the valley the débris and sediment which causes all the damage after it gets into the valley, the danger there being caused by the filling up of the channels with this sediment and the washing away of the farms below and the carrying of the sediment on down into the harbor.

Mr. WILSON. Could the Colorado River in that condition be controlled entirely on the American side?

Mr. MAXWELL. Oh, absolutely; there is no question about that. For the control of the floods of the Colorado River, the immediate work needed there is levees, but levees are only a temporary expedient, because no matter what they may do in building levees, the river will eventually fill up the channel between the levees, unless they go back and take the floods out on to the Mesas and distribute them over large areas, practically reproducing artificially in the Colorado River what is the natural condition in the Nile Valley. The flood water should be raised to the level of the Mesas by high weirs like the Lagune Dam above Yuma.

Mr. WILSON. I have heard this question mooted that before that thing could be absolutely controlled it would have either to be done by cooperation between this country and Mexico or else a concession by Mexico?

Mr. MAXWELL. That is true only with reference to the low-water flow of the river, which is needed for irrigation. Of course, we do not have the right to take the low-water flow away, but there would be no question ever raised of our right to control these floods and hold back the flood waters, because they will do just as much damage below the line as above. The Mexican owners would be very glad, indeed, to have those flood waters controlled, because by controlling the flood completely above the Imperial Valley they are necessarily controlled so as to obviate damage in Mexico. The point with reference to the Colorado River is that the dangerous floods they have

in the lower valley are caused by a combination of floods in the Colorado and Gila, and both of those rivers can be completely controlled by simply putting in large waste weirs, like the Laguna Dam, and putting the water onto the mesas and putting it out over hundreds of thousands of acres of arid mesas where the silt of the water would be of most wonderful benefit to the land, just as the floods of the Nile have fertilized that valley for centuries.

The CHAIRMAN. Where did the breaks occur which overflowed the Salton Sea years ago?

Mr. MAXWELL. It was just a little below Yuma, on the other side of the river.

The CHAIRMAN. In the United States or in Mexico?

Mr. MAXWELL. I do not know that I can answer that question. I am under the impression it was in Mexico; but I am not sure.

Mr. WILSON. Is that what made the Salton Sea?

Mr. MAXWELL. The Salton Sea originally, before this break, was a remnant of the old original sea which filled the entire Imperial Valley, but it had practically all disappeared by evaporation.

Mr. WILSON. It is receding?

Mr. MAXWELL. It rose to quite a height. It came up almost to the old Southern Pacific track, but it has been evaporating for the last few years. In that hot country water evaporates quite rapidly, and it is going down every year, but, of course, if the entire valley should fill, as there is always danger of occurring, it would take many years for the water to finally evaporate, because it would be 100 feet deep in some parts of the valley.

The CHAIRMAN. Just to clear up the matter, we would not be involved in any complications in Mexico, predicated on your theory that the floods should be controlled up at the headwaters of these rivers before it gets into Mexico?

Mr. MAXWELL. The works for the control of the Colorado River should begin up near the mouth of the canyon. The Gila could be controlled almost immediately after it leaves its canyon, and the Colorado should be controlled as far as possible up the river, after it comes out of the canyon, at the old Bulls Head Reservoir site and at other diversion points between there and the Laguna Dam.

That is all I care to say with reference to the Colorado River, and these other locations I have brought those questions up more particularly to endeavor to make it clear to the committee that it is essentially necessary for the safety of these other communities that a general measure should be passed in which there should be an apportionment of at least a moderate sum for immediate work—work which in its very nature is emergency work.

The CHAIRMAN. I notice you did not mention the Sacramento. Is there not some problem in the Sacramento?

Mr. MAXWELL. I omitted reference to that because Mr. Curry, who is a member of this committee, is more familiar with that than I am. I felt that I might be trenching on some plans he might have with reference to that project, which might not harmonize with my suggestions.

There are really two problems connected with the Sacramento River: One is the question of "opening the neck of the bottle," as Mr. Curry will recall the expression, and that is a very important thing, and one for which whatever appropriations are made by the

National Government should be made with all possible expedition. I never could see any reason why, if that is to be done, it should not be immediately completed. It ought not to be delayed and take the possibility of a big flood in the delta, with heavy losses resulting, merely because it had been delayed.

With reference to the by-pass, there is a very vigorous controversy about that in California at the present time, and I suppose it would be better policy not to bring it in here. But as to the question of the widening of the mouth of the river and increasing its carrying capacity, that is something Mr. Curry will agree that everybody is in favor of and exceedingly anxious to have expedited.

Mr. CURRY. Everybody is in favor of the by-pass, except, perhaps, a half dozen people in the valley.

Mr. MAXWELL. The landowners in Sutter County are very vigorously objecting to moving that by-pass out of the center of the "trough," where it naturally would have been put, and moving it over on the east side, where the water coming in from the streams on the east would have to back up over their land instead of finding its way into the original trough or natural by-pass. But that is a matter as to which a very bitter controversy exists, and I do not care to bring it in here at all.

Mr. CURRY. As far as that controversy is concerned, that is a local proposition, to be determined by the Army engineers, the State board, and the property owners.

Mr. MAXWELL. I think you are right about that. I have no desire to project it into this forum. I do not think it would be advisable to do so. But I think Mr. Curry is in harmony with that idea that the opening of "the neck of the bottle," as the saying goes, ought to be expedited with all possible haste.

Mr. CURRY. The Supreme Court has recently upheld the authority of the reclamation board.

Mr. MAXWELL. I heard that before I left California, and since I left there I heard that some very recent decision had been handed down in which the landowners have prevailed, but I might have been misinformed.

Mr. CURRY. The Supreme Court upheld the authority of the reclamation board and the Army engineers.

Mr. MAXWELL. Sometimes legal authority is upheld which is working an injustice to private individuals, as it is claimed has been done in the Sacramento Valley, and I think the chairman will agree with me that the same injustice has been done with reference to some lands in the Mississippi River Valley.

Mr. CURRY. I mean justice has been done there, because under the provisions of the law in the State the property is assessed according to the value derived, and any property injured is compensated for.

Mr. MAXWELL. In that matter I will have to refer you to the Sutter County farmers. I do not believe we can settle that question here.

Mr. CURRY. The contest originally was located in one reclamation district, and a very few farmers in that district were opposed to the plan, and they were opposed to it because water during some parts of the year would go onto their land.

Mr. MAXWELL. There is a very bitter controversy; there is no question about that.

With reference to the Pittsburgh situation, I want to say just a word:

The importance of prompt action in the Pittsburgh district is the necessity of acquiring the ownership of the reservoir sites before they all pass into private ownership. Since the publication of the Pittsburgh report, I am informed that quite a number of those reservoir sites have passed into private ownership, and if this Government is going to enter upon the policy of flood control, certainly the lack of a few dollars required to be turned over to the White Mountain-Appalachian Forest Commission to acquire those reservoir sites the Government ought not to take the risk of indefinitely delaying the construction of those reservoirs, because they may fall into private speculative ownership. I think that any fair-minded man will agree to that.

That it would take some little time to build reservoirs is another proposition. We have got to recognize that fact; but if those reservoir sites should fall into speculative ownership, there is a prospect of interminable delay resulting only in the difference as to the amount which should be paid for the sites, and the quicker the United States Government acquires them the less likelihood there is of that kind of delay.

The CHAIRMAN. That would necessarily come after survey has been made of the watershed?

Mr. MAXWELL. No; that survey has been made, Mr. Chairman, and very thoroughly made, by the Pittsburgh Flood Commission.

That the Government should build a reservoir on that survey I would not contend, but that the location of the site necessary to build it is established by that report, I think there is no question.

The CHAIRMAN. I do not suppose you would urge that the Government acquire reservoir sites until it had determined that those reservoir sites were necessary in the control of the flood problem?

Mr. MAXWELL. That whole question is so thoroughly thrashed out in the report of the Pittsburgh Flood Commission that it seems to me it would be merely borrowing trouble to await the completion of another long and expensive investigation before acquiring the sites which that report makes clear must be eventually acquired, and should therefore be immediately acquired.

The CHAIRMAN. The Army engineers who investigated the situation out there told us that the data they have now is so incomplete that they could not do more than make a guess at it. Assuming that to be true in that state of the facts, would you think it would be wise to go ahead?

Mr. MAXWELL. Yes; Mr. Chairman, I would, because if anyone will take that report and go through it carefully I think you will see that the engineers of the flood commission, who are just as good as any Army engineers who have ever lived, have examined that question in the most elaborate manner, have published a report upon the location of reservoir sites, and have in their survey covered everything, even to the contour lines; I am not contending that the Government should go on and build on those plans, but I do contend that it is information upon which the Government should protect itself by acquiring the sites, that is all.

The CHAIRMAN. Do you think as a general policy it would be wise for Congress to accept surveys made by engineers who are not connected with the Government?

Mr. MAXWELL. To the extent of protecting itself against speculative demands in the acquisition of reservoir sites I should certainly say yes; I think there is no question about that.

The CHAIRMAN. And you would not wait until some engineer of the United States Government had made the survey or checked it up?

Mr. MAXWELL. Where such exact and careful and thorough surveys as those made by the Pittsburgh Flood Commission are available, I think that the Government would not be justified in waiting during another long period of investigation while the speculators acquired the sites.

The CHAIRMAN. Mr. Maxwell, I ask you this question, because I know there are very few men who have studied this question more carefully than you have, and for that reason I want your opinion: You say where it is plain so thorough an investigation as this had been made the Government would be warranted in doing that? How is the committee to determine upon the thoroughness and completeness of any survey? Ought the committee to take its own judgment in this matter, or ought it to have some engineer connected with the Government either to check the matter over or to make separate investigations, after determining where that survey was?

Mr. MAXWELL. My answer to that, Mr. Chairman, would be that the machinery necessary for governmental action should be created by a bill embodying the authority for immediate action which is conferred upon the waterways commission and the river-regulation board by the Newlands-Broussard bill. A board having power to act in such matters should be created, then that board should determine whether or not this survey is sufficiently detailed and accurate, and it would be a matter of 30 days to run it over and check it up.

The CHAIRMAN. That will then be a checking up or investigation or review by some Government agent?

Mr. MAXWELL. Oh, I meant to make myself clear on that point. I am not advocating that the Government should go in and spend its money without this matter being acted upon by an authorized board of the United States Government having just as much authority in the matter; for instance, as the Army engineers have to-day where authorized to act, or as the Secretary of the Interior has under the reclamation act. The creation of such a board, with immediate power to act, and to do these things which require some immediate investment of money, is what I am now urging upon the committee. That is all provided for in this Newlands-Broussard-Rainey bill now before the committee.

Mr. CURRY. If this committee should take the Newlands-Broussard bill as a basis and report out some plan to coordinate all these propositions of flood control, and the questions connected with it, and place it in the hands of some department to put into practical operation and make report, do you think that such a commission should accept private surveys?

Mr. MAXWELL. I think that it should be left to them to decide, in the case of the acquisition of reservoir sites, whether the private sur-

veys were sufficiently accurate to justify the Government in acquiring any site for the protection of the Government before it passed into private speculative ownership.

Mr. CURRY. Do you think any commission so created and appointed and authorized would accept the surveys of engineers employed by private interests?

Mr. MAXWELL. Not necessarily, without going over them to a certain extent, but, bear in mind, Mr. Curry, that with a very small appropriation the Army engineers went over this whole thing and have already reported on it, and the only objection they found was that it was not justified for the benefit of navigation.

The CHAIRMAN. They are officially responsible to the Government.

Mr. MAXWELL. Exactly.

The CHAIRMAN. Those other engineers are not officially responsible to the Government?

Mr. MAXWELL. If you had a board that is officially responsible to the Government and that had authority to put engineers into the field to check up the Pittsburgh report, exactly as the Army engineers did, and they did check it up, that would be the second time the Government has checked it up, and that should decide the two points raised by the Army engineers; one, that it was not justified in the interest of navigation, and the other that the reservoirs would cost more than the Pittsburgh flood commission estimated. Those were the only objections urged by the Army engineers. If they wait until those reservoir sites are all absorbed into private ownership and have been acquired by people who got them for no other purpose than to sell them to the United States Government or to sell them to some one else, the delay will be seriously detrimental to the interests of the public. Hence it is most essential that the Government should act without delay.

Mr. CURRY. That is a different proposition altogether. I understood the first proposition to be presented was that you said the Government should accept surveys of the private engineers.

Mr. MAXWELL. If I was understood so, I think I corrected that misunderstanding of my position when I tried to make clear to the chairman that what I am contending for is for the passage of a general measure like the Newlands-Broussard bill, under which a board or boards will be created having authority to pass upon these things and giving them the authority and the funds to enable them to act promptly, so that, for instance, the danger to the Imperial Valley shall no longer hang over them; so that the danger from floods in southern California shall no longer hang over them; so that the danger also to the Sacramento and San Joaquin Valleys shall no longer hang over them; and that relief should be given promptly, without the interminable delay that we have had to pass through in past years before anything could be done.

Mr. CURRY. I think there is some ground for your contention there.

Mr. MAXWELL. That is all I contend; and I think, furthermore, very few people understood how marvelously accurate and complete the surveys of the Geological Survey, Reclamation Service, and Army engineers are with reference to the whole western half of the United States. I do not think they are so complete in the East.

My time is passing, and I have a good deal to say about the Mississippi River, and I want to get started with it and cover that ground as quickly and as logically as I can. I am not going to undertake to cover the general ground which Mr. Cooley so ably and in such a masterful way covered yesterday. I am merely going to present the case of the Mississippi River from the practical point of view of what is necessary to take care of the great navigation and commercial and maritime interests that are dependent upon the river, more particularly as they are concentrated at and centered in the city of New Orleans.

If it were possible for this committee to realize the apprehension of tragedy with which the atmosphere is surcharged in that lower valley when there is known to be danger of a crevasse or when a crevasse is actually occurring, you would appreciate more fully the need for prompt action and the need for comprehensive action which will absolutely safeguard that lower valley.

It is no use to turn to the records of engineers in the past to ascertain whether or not they have said that this thing or that thing or the other thing could happen.

The Poydras crevasse did happen, and another crevasse like it is likely to happen at any time, when the river is up for a long time as it was that year. If the Poydras crevasse had not been checked—and it was almost by a dispensation of Divine Providence that it was possible to check it—the whole Mississippi River would probably have cut out at right angles and gone over into Lake Borgne. One of the most beautiful and fertile sections of that country would have been destroyed, and the Eads jetties might have been imperiled if that Poydras break had not been closed before a crevasse actually occurred.

There is only one way to make it absolutely certain that such things are not going to happen in the future, and that is to fix a flood level at New Orleans, above which the water shall never go. That flood level at New Orleans should be 16 feet and no more. I think Mr. Caffrey, who is here from New Orleans, and who has spent his life in Louisiana, and Mr. Parker, who is here this morning, manager of the association of commerce, will bear me out in that statement, that it is not a question of protecting the land from overflow by raising the levees high enough so that the water will not go over them. The higher you raise the levees the more danger you are in. It is a proposition of fixing a flood level above which the water shall never be allowed to go, so that the hydrostatic pressure upon the strata below, caused by raising the flood level, shall never be increased beyond the point at which it is tested year after year.

We can not test the power of the strata to withstand hydrostatic pressure in any other way except as they say the old Romans used to test their engineering works, that is, to see if they stood up after being built. If they did, they were correctly constructed; and if they fell down they were wrongly built.

You can test a bridge when you are building it, or before it is built, but you can not test in any way except by putting the pressure on it, the power of the adjacent strata to withstand the hydrostatic pressure to which it is subjected by confining a flood between levees.

Of course, everyone who is familiar with the Mississippi Valley realizes that some of the most serious crevasses they have had there

have been entirely due to blow-outs; due to the pressure upon the strata being greater than the strata could stand, and the water being forced up inside the levee. The great Salem crevasse, on John M. Parker's Roosevelt plantation, opposite Vicksburg, was of that character. I understand the last Hymelia crevasse was of that character, and this Poydras crevasse was probably caused by some condition of that kind, although the engineers have never agreed as to its exact cause, so far as I know.

The CHAIRMAN. You say the Salem crevasse near the Roosevelt plantation?

Mr. MAXWELL. Yes. I refer to the crevasse on John M. Parker's plantation in 1912. That crevasse was caused in that way, Mr. Chairman. Mr. Parker and his friends were out on the levee within half an hour or so before that crevasse took place, congratulating themselves that the levee was going to stand. They went back to the house, and here [illustrating] was this little sand boil, and before they could get there with sacks there was a geyser there, and before long the levee sunk and the river rushed through and the crevasse finally widened to 5,500 feet. The crevasse was not caused by the breaking of the levee; it was a weakness of the understrata, so that the water forced its way through under the levee.

If we were compelled to rely upon our own theories in this matter as to the advisability of spillways, we might perhaps come before this committee with less confidence. But there never was an abler Army engineer on the lower Mississippi River than Capt. Sherrill, and Capt. Sherrill has, over his own signature, in reports with reference to that situation in the lower Mississippi Valley, commended this plan of wasteweirs or spillways, for the purpose of holding the maximum flood level down to a certain height. I wanted to place his statements before the committee and arranged to have that book here, but I do not think it has come yet.

The CHAIRMAN. You can file it.

Mr. MAXWELL. I only wanted to file an extract from it.

They had an experience in New Orleans many years ago which converted many people there to the advisability of what has often been called the "outlet system," but it is a misnomer when applied to the plan we are now advocating. I want to impress that on the committee. We are not advocating "outlets," in the sense that they have usually been understood. What we are advocating is wasteweirs or spillways, over which the water from the river will spill in a long, shallow stream, when it reaches a certain point, the idea being that if that is as high as the water can go behind that levee with safety, it is better that it should run over and be controlled after it runs over, without breaking the levee, than that you should have such great crevasses as the Nymelia or Buck Ridge or Salem crevasses, or any of the hundreds of crevasses which have happened there in the past.

It may not be practicable, Mr. Chairman, to carry that system of wasteweirs or spillways far above the outlet of the Mississippi River into the Atchafalaya, but it is entirely practicable to build one from the Mississippi River into Lake Borgne and to build one above New Orleans into either Lake Maurepas or Lake Pontchartrain.

We speak of "Bonnet Carre" as being a good location for a spillway, because there was a crevasse there once which was not closed

and operated as a wastewear or spillway many years there. Do you remember how many years it ran, Mr. Parker?

Mr. PARKER. It was 10 years.

Mr. MAXWELL. Ten years. You will all see that the value of this system of holding the water down to a fixed maximum flood level was practically established by the Bonnet Carre crevasse.

The CHAIRMAN. What effect did that have?

Mr. MAXWELL. It held the water at New Orleans to a fixed level, and it never went beyond that so long as that crevasse was open.

The CHAIRMAN. What effect did it have on the lake?

Mr. MAXWELL. It carried more or less sediment into Lake Maurepas, but it is pretty generally conceded in that country that it is better to take chances of getting sediment into Lake Maurepas, or even into Lake Pontchartrain, once in 5 or 10 or 15 years, perhaps, than to live under the danger of the subsidence of a levee in the city, which must be recognized as not only a possibility but a grave and present danger. Capt. Sherrill brings it out clearly in his article, which I desire to present to the committee, that it is not at all safe to assume that these subsidences will occur only when the river is down or going down; that they do occur, they have occurred, and they may occur again when the river is high, and particularly is there danger that they may occur where the banks are so very steep as they are about New Orleans at any time. If one should occur and let the river into the city of New Orleans unexpectedly, anyone can realize what a frightful disaster that would bring about.

It is not that we think that is going to happen; but, gentlemen, is it not just as important that a precaution should be taken, which we know will prevent it, as that it was that they should have built the Galveston sea wall before the great hurricane, if they had known of its coming. We know of this danger, and those two spillways would very largely reduce the danger in New Orleans.

The CHAIRMAN. Is it your idea, Mr. Maxwell, that the committee in making provision—if it should make provision—for the lower Mississippi River should direct the engineers to build those spillways?

Mr. MAXWELL. No. It is our contention, Mr. Chairman, that the committee in framing the general bill should insert a clause similar to the clause in this bill, in which it is a part of the clause appropriating the appropriation to the Army engineers.

One reason why I am particularly anxious to get this matter clearly before the committee is the fact that in the announcement of the President's recommendations to the Democratic caucus, and in the announcement in yesterday's or day before yesterday's paper, with reference to a bill that the chairman of this committee and the President were said to have agreed upon, there was no reference to anything but levees and revetments.

Of course, I do not assume there was any intention of not considering anything else, but I have thought it of very great importance that the necessity for something more than levees and revetments should be impressed upon the committee.

The CHAIRMAN. I will say now that the President and I did not agree on any of the engineering features in the bill at all. I did not see that statement in the paper; if there was such a statement in the paper it is not true.

Mr. MAXWELL. The statement referred to instructions or recommendations to the Democratic caucus.

The CHAIRMAN. You are talking about the bill that the President and I agreed on. We did not agree on anything.

Mr. MAXWELL. This is the provision—

The CHAIRMAN. Since that matter has been brought up, I will say that no bill has been drawn. We have not had any bill to discuss with the President. The committee has not agreed on any bill. The subcommittee that was appointed to thrash out the bill has not even made a report.

Mr. MAXWELL. I meant to make it clear, Mr. Chairman, that I was not basing anything that I say on the assumption that the newspaper report was correct. My experience is that it is always safe to assume that all newspaper reports are incorrect until the contrary is proven, then we have a basis of assumption.

The importance of these spillways and of the Atchafalaya outlet to the city of New Orleans and to the whole lower river country is so acute, so absolutely overshadowing in its importance, that I feel that I am not going too far to take up some time of the committee with this matter.

All we ask is that in the bill itself there should be a provision broadening the sphere and practical instructions to the Mississippi River Commission, so that we will no longer have to fight inch by inch, inch by inch, and inch by inch for many years for something that ought to be built this year. This provision is contained in the Newlands-Broussard-Rainey bill [reading]:

For the Corps of Engineers, United States Army, for building bank-protective works to prevent erosion and cutting of the banks and consequent caving, and to control the river and hold it in a permanently fixed and established channel, and for building and maintaining levees, revetments, dikes, walls, embankments, gates, waterways, by-passes, cut-offs, spillways, controlled outlets, drainage canals, flood-water canals and channels, weir dams, sill dams, retraining dams, impounding basins, and bank-protective works for river regulation, etc.

The thought there, Mr. Chairman, was to let it be made as clear as the English language can be written that the law contemplates that the Mississippi River Commission shall do everything which their engineers shall report as being appropriate to remove that danger, and that the appropriation to do the work should be made in the bill, so that we can get the bill in such form that when we get the recommendations of the Army Engineers and the Mississippi River Commission we have not got to go back to Congress and wait an indefinite length of time to get the money to build them.

The CHAIRMAN. Give the language of the bill. Are not the words that you just read—waste weirs, by-passes, and all that—matters of limitation? If that should be put into the bill, would it not necessarily be construed that the Engineers can do any one of those things or all of those things, but can not do anything else.

Mr. MAXWELL. That might be so if that point were not covered by a general provision that they should not be so limited.

The CHAIRMAN. You did not read that.

Mr. MAXWELL. I did not read the whole clause; I do not recall whether that general provision is there or not.

The point you make, Mr. Chairman, is all right; I do not question that at all.

The CHAIRMAN. Then, let me ask you this question: Why would it not do, instead of enumerating a great many things that they may do, and following that by a general clause "or any other matters that in their opinion were desirable to do," be better to leave out all of the specifications and just include in the bill the general provision authorizing the Engineers to make this investigation and ascertain how floods ought to be controlled, and then do it?

Mr. MAXWELL. It might be, Mr. Chairman, if it were not for the fact which I might illustrate by the story of the young lawyer who appealed his first case to the Supreme Court, and who went into court with a great array of books and was reading all his authorities to the court, occupying a great deal of time to establish points which the court considered were elementary; and the court said: "You must assume that this court knows some law." The young lawyer replied, "Oh! no; I made the mistake of assuming that in the lower court."

The trouble with this situation is that if you do not put it into the bill the Army Engineers will, in my judgment, require a conversion that will take more time and more energy than the people of the lower Mississippi Valley can gather at this time to get them to do it, because the policy of the Mississippi River Commission has been against it in the past.

The CHAIRMAN. You think it would be inadvisable, then, for Congress to assume that the Engineers really know how to do that?

Mr. MAXWELL. Yes, sir; I do think so.

The CHAIRMAN. And you think it would be safer for this committee of laymen to undertake to tell the Engineers how to do it than to trust to the Engineers to tell the committee how to do it?

Mr. MAXWELL. I do not think you quite understand my proposition. The proposition is that if you state in the bill that the Mississippi River Commission has authority to build waste weirs and spillways and to control the Atchafalaya outlet, that it is an expression of Congress to them that Congress at least considered those things worthy of very careful consideration and investigation.

The people of the lower Mississippi Valley have been for 10 years and over endeavoring to convert the Army engineers to thinking that they should in some way lower the flood plane at New Orleans instead of steadily raising it, but up to the present time the thing has just been boggled along and nothing has been done. The terrible menace to that community continues merely because of the apparent stubbornness of some individuals.

The CHAIRMAN. If you please, would not the best way to accomplish that be, as is sometimes done in some countries of the world when the appointing power appoints a court, to ascertain what the proposed members of the court think beforehand on certain matters and then appoint them? Would it not, in order to accomplish that, be best to find out some engineers who agreed, with this theory, and then appoint them to do the work?

Mr. MAXWELL. We would be most delighted, Mr. Chairman, if it were possible to get Capt. Sherill back on the river, and put him in charge of the work, if it were practicable. It no longer can be said that Army engineers—

The CHAIRMAN. If we put him back, we would, of course, have to put some limitations in there in order to guarantee—

Mr. MAXWELL. I was only following up the suggestion of the chairman. Of course, I am free to say that if Congress indicates to the Mississippi River Commission, in the wording of this bill, that they class wasteweirs, spillways, and controlled outlets like the proposed controlled outlet on the Atchafalaya, with revetments and levees, that there will be very little difficulty in getting this work done.

The CHAIRMAN. In the project as adopted and under which the Mississippi River Commission is proceeding, they were left entirely free to suggest such means as in their opinion seemed best.

Mr. MAXWELL. Yes; and that is exactly what we are complaining about, Mr. Chairman, that they have adopted levees and revetments, without any recognition of the fundamental, primary necessity of lowering the flood level of the Mississippi River at New Orleans, and keeping it permanently lowered, to avoid danger to New Orleans and that whole country, when it is agreed by Army engineers themselves, some of whom are still in the service and some who have come out of the service, that it is entirely practicable. It is certainly a remarkable situation when it is agreed by an Army engineer, who has been specially detailed for that work and published in a book to go out to the world, that these wasteweirs are necessary for the protection of New Orleans, and still the Mississippi River Commission fiddles along with it and the people can not get it done.

Mr. HUSTED. They go further than that. The Mississippi River Commission is represented by the engineers before this committee, and say that the outlet would not reduce the flood level at New Orleans.

Mr. MAXWELL. I do not see how they can say that, Mr. Husted, when it is a known fact, and they have published it in their reports, that the present outlet at the head of the Atchafalaya takes off approximately one-fifth of the entire Mississippi River at that point when the river reaches its maximum flood stage.

Mr. HUSTED. I should qualify my statement. They say it would only temporarily relieve conditions; that eventually the flood liability would be just as high.

Mr. MAXWELL. Their theory, Mr. Husted, is that if you lessen the cross section and the volume of the water that is being carried that sediment will be deposited. They have contended for years that if they closed the Atchafalaya outlet that the river would scour its channel below, and that the river would carry just as much water below the Atchafalaya as would go out through the Atchafalaya.

Mr. CHAIRMAN. Without elevating the level?

Mr. MAXWELL. The idea expressed in that report was that if you could divorce the Atchafalaya River from the Mississippi, that the Mississippi would erode its channel sufficiently large in a reasonable time to carry the excess water.

The CHAIRMAN. Without elevating the flood level?

Mr. MAXWELL. I do not know that they said that.

Here we find that the Mississippi River Commission and the Board of Engineers of the Army disagree upon that very point.

In this report, which is entitled "Separation of Red and Atchafalaya Rivers from Mississippi River" (H. Doc. No. 841, 63d Cong.,

2d sess.), the Board of Engineers, on page 3, referring to the Mississippi River Commission, say:

SEC. 3. The commission states that the control of the flood waters of the rivers is, however, a more complex problem. Its investigations of the flood of 1912 lead to the conclusion that if the river systems had been separated, the flood height in the Mississippi River just below the mouth of the Red would have been increased about 4 feet. It believes, however, that such increase would not be permanent, as the confined waters would in time tend to enlarge the river cross section and reduce this excess of flood heights.

But the board of engineers say this, and they differ from the commission, section 8, page 4:

While the board concurs in general with the views of the Mississippi River Commission, it believes that the cost of the project discussed would be greater than estimated on account of the probable necessity for revetment work to protect the banks when subjected to the action of higher floods and that the period in which the confined floods of the Mississippi would, if ever, cause a compensating increase in cross section through erosion would extend over so many years as to have no practical bearing on the present problem.

The CHAIRMAN. Is that the Atchafalaya report? Let me see it, please.

Mr. MAXWELL. With pleasure. That is the difficulty we are in, Mr. Chairman.

The CHAIRMAN. I will just read this from the report [referring to report furnished by Mr. Maxwell] as to whether or not it would elevate the flood level.

Mr. HUSTED. What page, Mr. Chairman?

The CHAIRMAN. Page 4. [Reading:]

In this case it believes that the interests threatened by the proposed work, including the city of New Orleans, are of greater importance than those to be benefited thereby, and it therefore reports that in its opinion it is not advisable for the United States to undertake a project for the permanent separation of the waters of the Red and Atchafalaya Rivers from those of the Mississippi at the present time.

The CHAIRMAN. It is evident, then, that the reviewing board does not reach the opinion, or that the commission did not reach the opinion, that the section of the river would be so enlarged that it would carry the waters that now go out of the Atchafalaya without raising the flood level?

Mr. MAXWELL. You are reading from the report of the board of engineers?

The CHAIRMAN. Yes.

Mr. MAXWELL. They say it would not erode so as to carry it, within any reasonable time, but the Mississippi River Commission had taken the position that it would.

The CHAIRMAN. Col. Townsend made the statement that the question of enlarging the section by scouring the river is a matter that will require so many years that it will be of practical importance to the people of the twenty-fifth century rather than now.

Mr. MAXWELL. That may be his opinion. I am only referring to this report.

The CHAIRMAN. Let me ask you another question, because I want to get your views clearly on this: The committee has not reached any conclusion yet on the bill nor what the bill will carry. We are very anxious to get a bill that will solve the problem. We are not

wedded to any theory, and I want to know if it is not your opinion, and if it is not a necessary conclusion, that the committee itself ought to put into the bill that the engineers must do this in a certain prescribed way?

Mr. MAXWELL. No.

The CHAIRMAN. It is not?

Mr. MAXWELL. No.

The CHAIRMAN. Then, do you think this language would be sufficient [reading]—

The commission shall take into consideration and mature such plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River; improve and give safety and ease to the navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the Postal Service?

Mr. MAXWELL. I think that is not strong enough, because they have had that provision for years and have been operating under it, and they have ignored it.

The CHAIRMAN. Under that authority they have a right to "mature such plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River; improve and give safety and ease to the navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the Postal Service," in any manner in which they may see fit.

Mr. MAXWELL. I do not question at all, Mr. Chairman, that that provision gave them the power, if they would exercise it; but they have had that power for years and have refused to exercise it.

The CHAIRMAN. Therefore you think we should direct them how to exercise it?

Mr. MAXWELL. You should specify this particular matter which the people of New Orleans desire investigated and matured. We do not ask you to direct that they shall build it. All we ask you is to specify that it shall be one of the things to be investigated and matured, just as the language is there—not to obligate them to build it.

The CHAIRMAN. Very well. It will be satisfactory, then, if the commission were required, authorized, or directed, in making their surveys, to examine and report specifically upon the proposition to locate waste weirs at certain definite points?

Mr. MAXWELL. Leaving that open to them. There is no desire to tie their hands on that point. What we ask is that spillways and the Atchafalaya should be put in the same class with levees and revetments when it comes to solving the problem.

The CHAIRMAN. Let me ask you another question, and see if we can get together on the Atchafalaya. The question whether or not it should be divorced has already been submitted to them.

Mr. MAXWELL. They have practically rejected that.

The CHAIRMAN. If the bill that we are trying to frame should provide that the commission make an examination and survey of the Atchafalaya and Red River Basins so as to ascertain what it would cost and how, of course, to control and prevent the floods in these basins from the flood waters of the Mississippi River, would that answer so far as the Atchafalaya is concerned?

Mr. MAXWELL. I can answer that question by reading a few words from this bill, which exactly expresses what we desire—it refers to

the Mississippi River—"including the Atchafalaya River as a flood-water outlet for the Mississippi River, and including the controlling works necessary for such use of said Atchafalaya River, and all levees and bank-protective works, cut-offs, and auxiliary flood-water channels necessary to control and prevent all overflows from said Atchafalaya River, which shall in this respect be regarded as in the same class with the Mississippi River, and entitled to the same recognition in the matter of levee construction and flood protection for adjacent territory as the main Mississippi River."

The CHAIRMAN. Do you think that we should authorize them to go onto the Atchafalaya and do whatever work is necessary on that river to prevent floods there without having first made an estimate of what it is going to cost and having advised Congress as to that?

Mr. MAXWELL. We ask that they should have the same power to go ahead and actually construct with reference to the Atchafalaya that they are given with reference to the main river.

The CHAIRMAN. They estimate—whether accurately or not, of course, the future alone will determine—and report to Congress just what it will cost to do the work which is now contemplated in their plans; they estimate and report just how and what it will cost to divorce the Atchafalaya from the Mississippi, and that, of course, would prevent the floods in the Red River Basin and the Atchafalaya.

Mr. MAXWEL. But would raise the flood level 4 feet in the river below?

The CHAIRMAN. I understand. The cost of raising the levees below the Atchafalaya in order to meet this excess flow is also estimated and reported upon; in other words, we know as well as we can ascertain from the engineers what it will cost to protect the Atchafalaya and the lower Red River basin from the flood waters of the Mississippi by means of their divorcement. In order to decide intelligently whether that plan should be adopted or whether we should go in and, by means other than the divorcement of these streams, provide for the control of the floods in those identical basins, we should, I submit to your opinion, be advised what these other improvements are going to cost. Do you not think so?

Mr. MAXWELL. I think, Mr. Chairman, that that can be just as well left to the board itself which is to be created by this bill; which I hope may be evolved from this committee, as the question of whether they should build a revetment at a certain place or a levee at a certain place. Of course, it is said that we have an estimate as to how much the levee system is going to cost, but it really is not an estimate that anybody can depend on. All we ask with reference to the Atchafalaya is this, and it is based upon a principle—I think every man will see the soundness of it—that the Atchafalaya to-day is being used as an outlet for about one-fifth of the flood water of the Mississippi, as things are to-day, and the floods that go down through there are tearing that country all to pieces. If that is not controlled, there is the most imminent danger in any great flood that the Mississippi will change its whole course and make a new channel for itself through the Atchafalaya River.

The CHAIRMAN. Mr. Maxwell, the fact is that it requires constant work on the part of the Government to keep the Atchafalaya open, not that the Mississippi tends to go down the Atchafalaya, but that

the Atchafalaya will close up forever unless we can continue to work on it.

Mr. MAXWELL. It is now open for a wide distance, and it is not entirely the part that they dredge that the floods go through. The flood overflows and goes through that whole section, and about one-fifth of the whole flood of the Mississippi goes out through there when it gets up to 2,000,000 feet at Old River.

The CHAIRMAN. At any rate, the engineers which we have had here examine and report to the contrary.

Mr. MAXWELL. No; the engineers report that Old River would silt up and gradually cause the divorcement if the dredging were stopped.

The CHAIRMAN. During the past few days and during this whole hearing, it has been stated to us that if we wanted to divorce the rivers all we would have to do would be to let it alone.

Mr. MAXWELL. During the last 20 years, Mr. Chairman, I have seen so many opinions and theories as to the Mississippi River absolutely vanish in the light of facts that I do not think we can assume an engineer's report decisive with reference to the future.

The CHAIRMAN. And right on that same point, you have, no doubt seen a great many opinions of laymen touching the Mississippi River, which have been demonstrated by subsequent events to have been wrong?

Mr. MAXWELL. I think, Mr. Chairman, that the opinions of laymen with reference to the Mississippi River have been better borne out by the experience of events than the opinions of engineers.

The CHAIRMAN. Then, do you think it would be advisable to create a board of laymen to advise us on the methods of flood control in the Mississippi Valley, rather than a board of engineers?

Mr. MAXWELL. No; but I should think that to leaven a board of engineers with one or two laymen, as the Mississippi River Commission is leavened, would be very desirable.

The CHAIRMAN. We did that 36 years ago. We put upon that board three Army engineers and two civilian engineers and one Coast and Geodetic Survey man, who is a civil engineer, and then one who is not handicapped with any information at all on the subject. You would not want further leaven than that?

Mr. MAXWELL. We are not asking that the Mississippi River Commission be discontinued at all. We are asking that this whole matter be left to the Mississippi River Commission. We are not asking for the creation of any new authority on the Mississippi River Commission.

The CHAIRMAN. The law now leaves it to them. You have no objection to the law as it is now?

Mr. MAXWELL. Yes, sir. Asking your attention again to the clause which I was previously reading, we ask for the establishment of this principle with reference to the Atchafalaya River: The Mississippi River, "including the Atchafalaya, as a flood-water outlet for the Mississippi River, and including the controlling works necessary for such use of said Atchafalaya River, and all levees and bank-protective works, cut-offs, and auxiliary flood-water channels necessary to control and prevent all overflows from said Atchafalaya River, which shall in this respect be regarded as in the same class with the Missis-

issippi River and entitled to the same recognition in the matter of levee construction and flood protection for adjacent territory as the main Mississippi River." That is what we want.

In other words, the fact that the Atchafalaya is being used as an outlet should put it under the control of the Mississippi River Commission and create the same obligation with reference to it as now exists with reference to the Mississippi River, and in no other way can the lower section of the river be made absolutely safe.

The CHAIRMAN. You spoke of a difference of opinion in the Sacramento River region. There is also a pretty sharp difference of opinion among the Atchafalaya citizens down therein the subject, is there not? Some of the people on the Atchafalaya are asking for divorcement, and the people below the mouth of the Atchafalaya, at New Orleans, are insisting that it be not divorced.

Mr. MAXWELL. Yes, sir. I am simply asking that inasmuch as the Atchafalaya is in fact being used as an outlet, that the outlet should be controlled, and that the maximum flood level at Old River and at Red River Landing should be fixed and established at a level which would make it possible to say to the flood on the Mississippi River below Old River, "Thus far shalt thou go and no farther." In other words, fix an absolute, arbitrary maximum flood level below Old River and the Atchafalaya outlet, above which the water could never go, and relieve that country of the fearful danger which is caused by seadily raising the flood level and increasing the hydrostatic pressure and increasing the danger of caving banks and increasing the danger of what they call subsidence.

The CHAIRMAN. Would you suggest to us what that will cost?

Mr. MAXWELL. We are not basing our position, Mr. Chairman, upon the question of cost. The Mississippi River Commission naturally will be the proper authority to decide that.

The CHAIRMAN. This committee must base its action, however, upon the element of cost. We must go to Congress and say that the Mississippi River Commission or some other board is authorized to expend so much money.

Mr. MAXWELL. We have taken it for granted, Mr. Chairman, that there would be some board created, for instance, like the board of engineers, that would have authority to determine upon these plans before the expenditure would be made. All that we ask is that this work which we are urging—the waste weirs and the control of the outlet through the Atchafalaya to hold the flood level down to a fixed maximum below Old River—should be classed in exactly the same category with all the other work that is being done through the Mississippi River Commission.

Mr. HUSTED. I have to leave, and I would like to ask one question, if you please, Mr. Chairman, before I go.

The CHAIRMAN. Yes.

Mr. HUSTED. I understand you are trying to leave this matter in charge of the Mississippi River Commission?

Mr. MAXWELL. Yes, sir; we make no other request.

Mr. HUSTED. In view of the fact that the Mississippi River Commission has been studying this problem for many years and have a well-developed policy of treatment, which consists in the building of levees and in the revetment of the bank, and that the engineers

have come before this committee and have told us that that is the only way, in their opinion, that this river can be controlled; they admit no other way, except the building of the levees according to the Government investigations, and the revetment of the banks to prevent erosion. Further, they have stated here clearly and specifically, in answer to direct questions, that there is no other method of controlling the river, in their opinion. In view of the fact that they have this well-developed policy, and that they have considered the question of outlets, and the question of levees, and all these other questions which you are bringing up, and in view of the fact that they have general authority under the law as it exists to-day to take up these other matters if they deem them wise and advisable, do you think that merely stating in a bill these various matters in specific language, namely, outlets and waste weirs, etc., would induce them to change this well-established policy? Do you think you would get any different results from what you are getting under the general law?

Mr. MAXWELL. Yes; I do think so. I think that the Mississippi River Commission is mellowing very much on this proposition, and that if this committee should go so far as to specify in a bill that these matters were to receive the same consideration, in maturing plans, that levees and revetments have, that we would stand a pretty good chance to convert the Mississippi River Commission.

Mr. WOODS. Has not one of the troubles been that there has not been appropriations sufficient for continuous work?

Mr. MAXWELL. That has been the chief trouble.

Mr. WILSON. To supplement the language that the chairman read, winding up with the clause to prevent floods, is it your opinion that the Mississippi River Commission has authority under that to investigate and to advise, and construct those spillways, etc., if they should reach the conclusion that that is the best method of controlling those flood waters?

Mr. MAXWELL. As a pure matter of legal authority, yes; but I think that it would go a great deal further in helping the people of the lower valley to get those things done if this committee would specify in the bill that those things are classed with levees and revetments as things which are to be considered and matured.

Mr. WILSON. If we should so specify and they should maintain their original position, and report against it, then what would you do?

Mr. MAXWELL. Then, we would have to come to Congress for relief.

Mr. WILSON. That is just the question. Our function is principally to legislate. We represent the legislative branch, and if we are going to leave this to the Mississippi River Commission as having the most definite information and the best authority we can find upon the question, then, what would you say, if their opinion does not coincide with your plan—that we are to turn that down and come back to Congress?

Mr. MAXWELL. Unless in this measure which is to be framed now you create a general board having supervisory powers over the Mississippi River Commission—and that is done in the Newlands-Broussard regulation bill, and it ought to be done in this measure which is to be framed now.

Mr. WILSON. I understand all are satisfied to leave this matter entirely with the Mississippi River Commission?

Mr. MAXWELL. I understand that the people of the lower Mississippi River Valley, if the Mississippi River Commission is to be advised that these matters are on a parity with levees and revetments, so far as I know, are willing to take their chances with the Mississippi River Commission.

Mr. CLINE. You do not agree fundamentally with the commission that the revetments and levees are the remedy to control floods?

Mr. MAXWELL. Below Old River, I certainly do not.

Mr. FOSTER. Has the Mississippi River Commission considered all these matters of which you have spoken?

Mr. MAXWELL. They have not even surveyed the Atchafalaya.

Mr. FOSTER. With reference to outlets?

Mr. MAXWELL. They have refused to even make a survey of them. They refused to make any report on the Atchafalaya until they were specifically instructed to do so by act of Congress.

Mr. FOSTER. With reference to floods, have they not studied the problem of these outlets through Lake Ponchartrain, or wherever it is you say, all those different places you spoke of?

Mr. MAXWELL. Capt. Sherrill's article says investigations are being made, but they have never, so far as I know, completed the surveys.

Senator NEWLANDS. Is Capt. Sherrill on the commission?

Mr. MAXWELL. He was the officer in charge of the Corps of Engineers in that district.

The CHAIRMAN. In 1913 Mr. Wilson called upon the Secretary of War who called upon the Chief of Engineers, to make a report on the various methods which had been suggested for flood control on the lower Mississippi, and I do not suppose they excluded any method that the imagination of man could conjure up; all methods were suggested. The commission reported on them and reported specifically on reforestation, on reservoirs, on cut-offs, outlets, diversions of flood waters into channels parallel to the main river, and on levees.

Mr. HUSTED. Did they make any recommendation as to spillways?

The CHAIRMAN. Nothing, unless diversion of flood waters and outlets is a spillway. There is no phase among all these suggestions that has not been very thoroughly investigated, as I understand it.

Mr. MAXWELL. The very thing that the people of the lower Mississippi Valley are asking now is that they be granted a rehearing against the repeated adverse decisions of the Mississippi River Commission in the past.

The CHAIRMAN. Have they not a right to that hearing now under the general law?

Mr. MAXWELL. Not in the same court, unless the court is required to give it to them.

The very thing that they complain about is that the Mississippi River Commission has insisted upon raising these levees higher and higher and higher and increasing the danger, when there is not the slightest engineering reason why the water should ever reach a foot above 16 feet at New Orleans, and although we have not the report of the Mississippi River Commission as to that fact, we have the absolute recommendation of the ablest Army engineer that ever was in charge of the lower river that that is the only way to protect New Orleans.

Mr. FOSTER. Who made that report?

Mr. MAXWELL. Capt. Sherrill.

Mr. FOSTER. There have been other able and competent engineers down there. I think it is a very broad statement to say that he is the ablest.

Mr. MAXWELL. I think he was the ablest.

Mr. FOSTER. That is only your opinion. You have no other authority except that you agree with what he did?

Mr. MAXWELL. I do not know that that is the reason. The engineers do not agree. The differences of opinion between the engineers themselves is evidenced by this report, where the Board of Engineers practically decided differently from the Mississippi River Commission in this matter of the Atchafalaya. This is a very important question.

The CHAIRMAN. We were talking about the spillways. The Atchafalaya has never been under the Mississippi River Commission?

Mr. MAXWELL. We want it put there.

The CHAIRMAN. Undoubtedly. That is somewhat aside from the question that we have before us now. This spillway that you speak of, into Lake Borgne, or this spillway into Lake Ponchartrain, is under the Mississippi River Commission. It has been under them all the time, and they have investigated that very thoroughly. Maj. Sherrill, as I understand, in his stay down there—how long was he down there?

Mr. MAXWELL. Several years.

The CHAIRMAN. In his stay there of four years, as some one has suggested, he arrived at this conclusion—that this was the way. The Mississippi River Commission in its study of 35 years has reached another conclusion.

Mr. MAXWELL. Pardon me, Mr. Chairman—I do not mean to contradict you there—but the Mississippi River Commission has reported against outlets which would change the current in the river. A spillway does not do that, and you can find in the reports of the Mississippi River Commission the qualification that while they oppose outlets they do not necessarily oppose the spillways which are merely to control the overflow.

The CHAIRMAN. Why do they not use them, since they have authority?

Mr. MAXWELL. It would be a long story to tell you why; but I do seriously believe that the reason why is that they got started on a wrong theory years ago, and merely from pride of professional opinion they have clung to it through all these years.

The CHAIRMAN. But the personnel of the commission has changed through all the years.

Mr. MAXWELL. Not so much.

The CHAIRMAN. There have been thirty-odd men on the Mississippi River Commission during these years, and sixty-odd engineers of the Army under them.

Mr. MAXWELL. Col. Townsend has been there a long time.

The CHAIRMAN. He has.

Mr. MAXWELL. And Mr. Taylor. Mr. Taylor has in some of his writings quite strongly approved of this idea of lowering the flood level.

The CHAIRMAN. Is that Judge Taylor?

Mr. MAXWELL. Yes.

Mr. CLINE. By spillways?

Mr. MAXWELL. Practically so.

Mr. CLINE. So that then the commission has had it up?

Mr. MAXWELL. They have.

The CHAIRMAN. Judge Taylor, who is not an engineer—but a very great man—I understand from you, is in favor of spillways?

Mr. MAXWELL. He expressed himself so. He did not use the word “spillway.”

The CHAIRMAN. What does he use?

Mr. MAXWELL. I think he uses the word “outlet,” but he qualifies it so as to make it clear that he does not mean an outlet so as to change the current of the river.

The CHAIRMAN. He was in favor of them; so, then, the commission has had this matter up, evidently.

Mr. MAXWELL. Yes.

The CHAIRMAN. And have decided against it?

Mr. MAXWELL. Yes; and the city of New Orleans does not propose to quietly submit to the danger that decision creates, without an effort to secure themselves against it.

The CHAIRMAN. I understand that perfectly, and what we are trying to get from you to-day is exactly what the city of New Orleans wants us to do.

Mr. MAXWELL. We want to put spillways in exactly the same category that you put levees and revetments.

(Thereupon, at 11.35 o'clock a. m., the committee recessed until 2 o'clock p. m.)

(Mr. Maxwell submitted an extract from a book entitled “Geographical Description of the State of Louisiana,” by William Darby, published in 1816, as follows:)

THE MISSISSIPPI RIVER.

Many treatises have been written upon this great river, but few correct philosophical ideas respecting it have been published. The cause of its rise and fall, the revolutions in its quantity of water, and the changes of its course have been too obvious to permit mistake; but the laws of its general motion and the real rapidity of the stream have been but little understood.

We may lay down the following as the universal law of the motion of water: It moves with equal velocity, in equal times, at equal depths, on equally inclined planes.

The preceding law, when once understood, is like that of gravitation—too obvious in its principles to permit doubt. The consequence of its application to rivers is that their waters, at equal elevations, move equal distances in equal times; therefore, when swelled by accretion of water, no additional velocity is communicated to the decumbent volume. If rain produces an accumulation near the sources of rivers, a greater inclination is given to the surface; therefore an increased rapidity is the consequence; but the decumbent waters continuing to move upon the same plane retain a uniform motion.

Either from inattention to the principles of hydraulics, or from assuming the velocity of the surface as that of the mass, the motion of all rivers have been overrated. Respecting none has ignorance of their true motion led to more erroneous conclusions than the stream of the Mississippi.

Presenting the following observations upon that very important river, we are far from pretending that our inductions will all be clearly drawn from correct reasoning upon the phenomena under review. We will exhibit the

facts to the public and give as far as our means of information extend an accurate view of the estuary of the greatest river in the United States territory, and the longest and largest stream of this globe, whose whole course lies within one sovereignty.

From the thirty-third degree north latitude to the mouth of Red River, only one bank of the Mississippi is in the State of Louisiana, the distance 306 miles. From the mouth of Red River to the sea (following the meanders of the river) is 326 miles. Fifty miles above the entrance the banks are too low for cultivation, therefore the arable lands below Red River, including both banks, may be estimated at 550 miles, and adding in round numbers 300 miles above Red River gives 850 miles as the cultivable border of the Mississippi, within the State of Louisiana. In making an estimate of the quantity of cultivable soil and woodland that would be adequate to a farming establishment, $1\frac{1}{2}$ miles may be assumed as the mean depth which ought to be included in the valuation of river lands; this data would produce 1,275 square miles, or 826,000 acres, as the arable superficies of fluvial soil adjacent to the Mississippi below the thirty-third degree of north latitude, considerably more than one-half of which is below Red River. Nothing can be more vague than an attempt to calculate the mean depth of the Mississippi; so much variation rises from the ever-varying height of the water, from projecting sand banks, from islands, and other localities. The breadth is equally variable as is the depth, but can easier be reduced to a medium. One observation may be made here that will apply to most rivers; that is, the overcalculation that is generally made of their width. From careful triangular measurement of the Mississippi, made at Natchez, at the efflux of the Atchafalaya, the efflux of the Plaquemine, and near to the efflux of the Lafourche, at New Orleans, Fort St. Phillips, and at the Balize, the medial width is found to be short of half a mile, or 880 yards. When not inflated by islands, it seldom exceeds more than 35 of Gunter's chains, or 770 yards; it is probable that if the numerous islands were estimated, the mean breadth might be established at 1,000 yards, without any very material error, but those islands only dividing and not augmenting the water, 800 yards may be safely assumed as the width of the cubic column of that element contained between the banks of the Mississippi. The velocity of the stream has also been extremely exaggerated. It is a well-ascertained fact that a common flatboat floating only during the day (say one-half of the time) will reach New Orleans from the mouth of the Ohio many days before the apex of the high flood. The rapidity of the middle current has given rise to very erroneous calculations as it respects the motion of the whole mass. Much delay is caused by the friction on the banks from counter currents and from the islands checking the waters below their points, so that perhaps 1 mile per hour is a high calculation for the surcharge of the Mississippi. A transversal section of the river is not a semiellipsis, but approaches that geometrical figure near enough to permit its use in estimating the cubic quantity of water contained in any given length. The opposing ordinates will not be of equal height, but as the figure becomes inverted in every bend the elliptical area will advance toward the truth to a very near degree of approximation.

From these premises we may imagine a semiellipsis, whose longitudinal diameter represents the river's breadth and whose longest ordinate, its depth, allow 150 feet as the length of the ordinate line, or depth of water at the greatest elevation, and 2,400 feet as the extent of the elliptical diameter, or river's breadth, we are confident that these constituent principles will give a very correct result. From the application of the above elements 141,372 cubic feet would be contained within 1 foot, longitudinal section, of the river. At the rate of 1 mile an hour, 5,280 feet in length would be discharged every hour, or 746,444,160 cubic feet of the entire mass (equal to 4,573,938,000 gallons). If the water at different stages of elevation is considered as superincumbent strata, every single stratum will move with nearly uniform motion, the friction of the superstratum having exactly the same tendency to retard its own motion as to accelerate the one next below.

The exposition of this simply hydraulic principle will demonstrate the falsity of the idea that the whole mass of water in the river moves with more velocity at different degrees of height. Though from the pressure of accumulating particles above, the superstratum gains more and more inclination on the plane of acceleration, yet the incumbent strata, preserving the same inclination, with little variation, must move equal distances in equal times throughout the year, very nearly. When the river commences to fall, the superficies continually

losing inclination, the upper column moves more slowly in proportion to its approach to a level with the curve of the sphere upon which it flows.

From the above premises the mean motion of all rivers departs but little from the extremes. We will now proceed to apply the principles laid down to their use in improvements made, or that may be made to render the bank of the Mississippi an agreeable, safe, and profitable residence. At the first epoch of the settlements on Mississippi no method appeared obvious, or indeed practicable, but to raise an embankment or levee of earth in front of every plantation. These levees, by stopping the overflow, reclaimed a small portion of the bank; by extending the levee every place may be made cultivable where the inclination of the earth's surface prevents the water from reflowing from behind. But the system of levees possesses a retroactive effect. The confined body of water, increased in height and by its natural impression every moment making an effort to break through, occasions annually serious injury to the planters on the coast, both above and below New Orleans. Nothing is more dreaded by the inhabitants than these fissures, or, as they are aptly termed, crevasses, yet from the natural carelessness of the human species no sooner does the flood subside than the danger and all serious reflections on the means to prevent its recurrence subside also.

During the great floods of 1811 and 1813 much damage was done by the water rushing through rents in the levee. Hitherto the only means to reclaim the lands adjacent to the river has been by levees, or to remedy any casual accident accruing to those levees has been to increase and strengthen them, which is one of the primary causes of the excess of the flood. Any person who, from long and careful attention to the subject, and who possesses a good map of the Mississippi and contiguous rivers and lakes, must be convinced that levees are inferior in efficacy to artificial sluices that would convey the surplus water in one or two bodies to the sea by any other route than the river. To explain this subject clearly it will be necessary to review the different outlets from and approximations of watercourses to the Mississippi from the efflux of Iberville to the Gulf of Mexico.

The real nature of the efflux of the Atchafalaya from the Mississippi and the features of that remarkable place have been noticed. The erroneous idea that the raft in the Atchafalaya impedes the issue of water from the Mississippi has been examined and refuted. But this question has never been canvassed, whether any works made on or near the Atchafalaya would tend to draw into that stream an additional column of water of magnitude sufficient to make a beneficial diminution of the body annually passing through the Mississippi. If it was practicable to divert into the Atchafalaya any much greater quantity of water than what enters that river in the highest floods so much damage would certainly be done to the inhabitants of Opelousas, but more especially those of Attacapas, residing in Prairie Grand Chevreuil, as to render such project inapplicable. It would be ruining one part of the community to benefit another. Throughout the extent of annually overflowed lands near the Atchafalaya is interrupted by so many strips of high land that are never or but seldom overflowed so as to render the distances between them at high water so many actual bays of from 1 to 6 feet in depth in any common annual floods. In 1813, when the Pointe Coupee Levee was broken, the water rose 4 or 5 feet above any elevation it had attained since 1780. During the month of June of that year, which is ordinarily the season of greatest rise, the level of the general body of water from the efflux of Atchafalaya could not have augmented in height more than 4 feet without having thrown the water of the inundation into the Teche in almost its whole length above the town of St. Martins.

From the efflux to the mouth of the Atchafalaya there is but one place where that water approaches very near the Mississippi. It has been remarked that from the Cow Island to the mouth of Plaquemines the course of the Atchafalaya is east. It is only 7 miles in a direct line from where the Plaquemine leaves the Mississippi to its discharge into the Atchafalaya.

Here, from the near approach of the latter to Mississippi, is one point where a considerable body of water could be drawn from that river without any very extraordinary expense. In autumn, when the waters are low, the tide reaches up the Atchafalaya and Plaquemines to Blakes, within 5 miles of the Mississippi. This fact proves that there is as much depression of surface in the short distance from the efflux of Plaquemines out of the Mississippi to its discharge into the Atchafalaya as there exists from the former point to the common level of the Gulf of Mexico, or, more concisely, the Plaquemines in its

comparative length of 7 miles has nearly the same perpendicular fall as its parent stream in a direct distance of 170 miles.

It will be seen from the preceding how much facility is afforded to the artificial drains by the great descent of the plane in a short distance, superadded to the beneficial diminution of the volume of the Mississippi, would be the incalculable amelioration of the navigation of the Plaquemines, were its channel made wider and deeper. The surplus water discharged at this place would not in spreading over the islands toward the mouth of the Teche produce the same ruinous consequences as would a much less quantity if drawn from the Mississippi by the Atchafalaya. It has been shown that all the distance between the high land of the Teche and that of Lafourche River is annually overflowed. A receptacle is offered to all that water that does naturally or that can by human means be abstracted from the Mississippi by the Plaquemine.

The Iberville, or Manchac, is another discharge of the Mississippi which admits indefinite improvement. It is 15 miles, in a direct line from the Mississippi to the junction of the Manchac with the Amite River. The united stream presents a fine body of water, admitting vessels of 6 feet draft. The tide flows up the Manchac to the mouth of Wards Creek, within 9 miles of the Mississippi.

It is a singular and curious circumstance that the tide in the Manchac and Plaquemines, flows within 15 miles of neutral contact, upwards of 200 miles following the stream, above the mouth of the Mississippi.

Gulveston stands on the right bank of the Amite at its junction with the Manchac. The ground is sufficiently elevated to admit the building of a city without any artificial accretion of soil. Was the bed of the Manchac made sufficiently deep and wide, to admit uninterrupted navigation; the advantages that would accrue to the commerce of Louisiana would be certainly immense. The point of contact between boat and ship navigation would be removed much farther into the interior of the country. A route would be opened for the direct introduction of the produce of the regions upon the northern waters of Ohio and Mississippi into the fine settlements of west Florida.

No great diminution of the waters of the Mississippi could be made by the Manchac without producing a refluant mass of water, that would materially injure the plantations upon the Mississippi between St. Gabriel Church and Bonnet Quarre.

It may be observed that there are two evils, arising from surplus water, to be remedied on the Mississippi; one, the incumbent waters in the river, the other the reflux from the swamps. It is in most instances very difficult to remove one inconvenience without producing the opposite.

It may be assumed as a postulatam, that no useful purpose, as it respects the consequences of overflow, can ever be answered by drawing part of the waters of the Mississippi into new channels, unless a reservoir into which the surcharge can be thrown exists within a few miles of the main stream. (See note.) This advantage is only offered by the Plaquemine on the left bank of the Mississippi. On the right shore Bonnet Quarre Point is the first place where a contiguous deposit for the water approaches sufficiently near the Mississippi. A moment's inspection of the map will at once determine this place, to be without comparison, the most eligible for the creation of a large channel of conveyance for the superabundant water, that every summer injure more or less, the inhabitants of Louisiana, seated upon the Mississippi between Manchac and the English Turn.

Like the descent at Plaquemine, there must be the same fall, from the low water mark at Bonnet Quarre to the level of Lake Ponchartrain, that there is from the former place to the mouth of the Mississippi. The actual distance from the Bonnet Quarre to point Ponchartrain is less than 5 miles. If a large canal of communication was cut, there is no doubt, but that an immense quantity of water could be drawn from the Mississippi. Finding an immediate deposit where the decumbent mass could expand, none or very little accumulation of water could take place, in the intermediate space between Ponchartrain and the banks of the Mississippi, in the parishes of Saint Bernard and Orleans.

How much a canal from Bonnet Quarre to Lake Ponchartrain would benefit the people of Louisiana, in their commercial pursuits is very difficult to determine. There is no doubt, however, but that a great part of the waters of the spring floods could be diverted from the Mississippi at this place. The real expense attending the necessary works would no doubt fall far short of the never ending expenditures of the levees and have the advantage of super-inducing much greater safety to crops.

Some persons have contended that if an open sluice of water was opened from Bonnet Quarre, or any similar place, that the entire body of the river would, from the rapid descent of the plane, turn into the new channel. Such suggestions, though plausible, are unfounded.

From actual and careful measurements, the depth of the Mississippi at Mr. Bringier's, 9 miles below the afflux of the Lafourche, was from the extreme high bank of the river, 153 feet. The depth of Pontchartrain is about 18 or 20 feet—never much less or more. The difference between the maximum and minimum elevation at Mr. Bringier's is 28 feet. The difference between the common level of Pontchartrain and the low-water level of the Mississippi is about 8 or 10 feet. From those elements it results that if we subtract 23 from 153, we have 130 feet as the depth of the Mississippi. If we add 10 feet—the perpendicular fall from low-water level in the river—to 18 feet, the common depth of the lake, and take the sum, 28, from 130, the remainder, 102 feet, is the least depth of the bottom of the Mississippi below that of Lake Pontchartrain.

The reason why the narrow necks in the bends of the Mississippi are so often and easily cut by the incumbent water is that they are mere walls of sand and earth which, when broken down, the water finds its usual capacious channel.

The bed of the Mississippi, like that of all other rivers, is the deepest valley in the country through which it flows. (See Note 2.) Nothing can have less foundation, on principles of sound philosophy, than the common notion of the liability of the Mississippi to desert its channel. There exists no data in the country to substantiate this opinion. Grand Lake, Lake Providence, Lake St. Joseph, Lake St. John, and Lake Concordia and Fause Riviere, on the right bank, and the Yazoo and Homoshitto Lakes of the east, were all, no doubt, once part of the Mississippi bed. These lakes are similar to each other, and differ entirely in their appearance and nature from all other lakes in the delta of the Mississippi.

If this great river had at any time flowed in any other route than the present, monuments would remain to attest that fact. The natural process of the Mississippi is to protrude the lands near its outlet. There are good reasons to believe that this protrusion is still in slow operation.

All observations made respecting a canal from Nonnet Quarre will equally apply to one, if made from Gen. Villaret's or Jumonville's plantation below New Orleans into Lake Borgne, by Bayou Bienvenu. Similar improvements may also be made from the Mississippi into Black Lake at the mouth of the River Aux Chenes, and at the prairie Aux Moules; but below English Turn, neither commercial facility nor diminution of overflow, would result as extensively from canals as above the latter place.

Perhaps, in fact, no situation on the Mississippi could be more beneficially improved than the space between Villaret's and Lake Borgne. This place has been rendered memorable by the advance toward New Orleans of the British Army in December, 1815.

These general remarks on the Mississippi might be much dilated, but we trust enough has been said to give a correct idea of the country adjacent to the bank and included in the delta of this noble river.

NOTE 1.—No correct judgment can be formed upon the best means of obviating the inconvenience of the inundation of the Mississippi without having determinate ideas upon the real motion of the water. That the rapidity of the mass of water in the Mississippi is usually overrated has been shown, but not only the body of the fluid in the river has been supposed to move more rapidly than it does; in fact, the current itself proceeds a much less distance in a given time than is commonly thought. The following, taken from actual measurement, will illustrate the soundness of the conclusions formed in the text:

From the Falls of Niagara to Lewiston is 7 miles, following the stream; about 5½ miles in a direct line. In this distance the water falls 104 feet; and from very careful measurement and observation runs within a small fraction of 4 miles an hour.

The given fall in the above distance is very much greater than the depression of the plane upon which the Mississippi flows. If the motion of the great mass of water was as great as is commonly thought, no inundation would succeed, the fluid must reach the Gulf too soon to admit accumulation. When the water flows from the main stream and meets with no place of deposit like Lake Pontchartrain, Lake Borgne or the Atchafalaya, it quickly rests on the back lands, and finally produces a reflux toward the river.

Water would be reduced to form by having fall enough to produce but very little more acceleration than is allowed to streams moving upon planes having very slight inclination, such as the Mississippi and Atchafalaya.

NOTE 2.—Mr. Schultz, in his travels, makes a similar remark respecting the Mississippi. Most writers on Louisiana being better acquainted with the surface than the bottom of this subject have drawn contrary conclusions.

AFTER RECESS.

The committee met at 2 o'clock p. m., Hon. Benjamin G. Humphreys (chairman) presiding.

The CHAIRMAN. We will hear you now, Mr. Maxwell.

STATEMENT OF MR. GEORGE H. MAXWELL—Continued.

Mr. MAXWELL. Mr. Chairman and gentlemen of the committee, one of the chief reasons why the people of the lower Mississippi Valley are so exceedingly anxious to bring about the adoption of the spillway or wasteweer system, supplementing levees and revetments, is the fact that it seems almost beyond question that if certain combinations of high water should occur the levee system would fail, that it could not carry the flood, whereas by this spillway system the entire State of Louisiana can be made absolutely safe from any possible combination of high water in the upper tributaries.

To illustrate that, of course, we are all more or less familiar with the floods of 1912 and 1913. If the flood of 1912 in the upper Mississippi and the Missouri—that is, the volume of water coming out of those streams in 1912—had been met by the volume of water that came out of the Ohio on that exact day in 1913, I think that every fair-minded man will concede that no system of levees thus far proposed could possibly have carried that water to the Gulf.

The CHAIRMAN. I do not happen to remember what that was.

Mr. MAXWELL. I do not have the figures here. I did have those figures in my mind formerly, but I have been out in California for a year, where we look at the water problem from a little different point of view. However, those figures are very easily ascertainable.

I was at Cairo after the flood of 1912. It seemed to be practically conceded there that the high water at Cairo was due to the fact that the levees below were not capable of carrying the water that came down from the three upper tributaries without breaking, and what saved Cairo in that flood was the fact that they did break. In other words, the Hickman break and the Golden Lake break and the Wilson break all took off a large amount of water and stopped the backing up which was taking place at Cairo in the flood of 1912, and which would have raised the water to a point no man knows where if it had not been for these breaks, which immediately let the water down.

The CHAIRMAN. How far below Cairo did the breaks occur?

Mr. MAXWELL. They were all comparatively near; so near that I understand there was no question of their having affected the level at Cairo. I am not positive that I have recalled the names of the crevasses correctly. I am giving these facts in a very general way, as it has been some time since I gave them particular attention, and I have not had an opportunity to refresh my mind on the exact details.

There was a very interesting illustration there at Cairo of how the water gorges the channel below. The Sacramento River is another good illustration of that. The narrowing of the channel at the mouth gorges the water back and raises it over the entire delta of the river. That is your understanding of it, is it not, Mr. Curry? I do not want to get into any differences of opinion between us as to the conditions out there.

Mr. CURRY. Yes; although the conditions in the Mississippi, as a matter of fact, are different.

Mr. MAXWELL. Yes. As a matter of fact, in the flood of 1913 the river at Wheeling would have carried, without any such disastrous flood as they had, all the flood water that came down the Ohio from above Wheeling; but there was such an immense volume of water came in from the Muskingum below Wheeling that the channel could not carry it off, and it gorged and forced the water to a higher level at Wheeling. It was much higher at Wheeling than it would have been if the Ohio had only had to carry the water which came down to Wheeling from above.

That question of how far the water will pile up is something that it is almost impossible for even engineers to estimate, and I do not understand that they have ever actually undertaken to estimate just exactly where the water might rise to at Cairo if the levees were made absolutely impregnable all the way down or exactly how high the levees would have to be. My understanding is that if the levees were brought up to the standard height now advocated the most they claim is that they would carry the floods of the past, but as to whether they would carry the floods we may have in the future, which may be different from or greater than those in the past, I doubt very much if they would claim that.

You take this last flood of 1916; the floods of 1912 and 1913 came from very much higher up than the Arkansas. My impression is that the Arkansas brought in a much larger flood this year than it did in 1912 or 1913. I may be wrong about that, but that is my impression. So there is always a menace hanging over them in the lower Mississippi Valley from the possible combination of high waters from two or more of the rivers above, which makes their condition one of uncertainty, even though everything were done which is contemplated by the system of levees only with revetments.

It may seem a very selfish point of view, but I think the people of New Orleans feel generally that one element of the safety of New Orleans lies in the fact that the levees are almost certain to break above New Orleans, and that no break will occur in the city itself, because the levees above are weaker. New Orleans does not oppose the strengthening of the levees above. They favor it. But they do ask that simultaneously, and as a part of the same system, these safety valves shall be created which would spill the water over at a certain fixed height, beyond which it would not be safe to permit the flood to rise. In other words, they desire an absolute guaranty that although the floods might otherwise go above that level, no matter how much water came down the river in any future year, they would have absolute safety and security—absolute safety against any possible flood of the future, no matter how great a flood might occur.

If the Atchafalaya outlet were absolutely controlled—and I want to say right there that when we use the word "outlet" we do not

mean an outlet in the sense in which it has been used in the past in much of the discussion of this subject. The plan with reference to the Atchafalaya is that there should be a long, controlled spillway at the Atchafalaya over which the water would spill into the head of the Atchafalaya and go on down the Atchafalaya to the Gulf, whenever the river rose above that point, so that on the Mississippi River for its entire length below the Atchafalaya you would have absolute safety.

Now, I do not want to take up too much time, but I have here various reports and a Senate document relating to the Mississippi River Commission, and, if there is no objection, I would like to have these put into the record; but just in order to bring out this point, I would like to read a few clauses that bring out the difference that we are anxious to have maintained between what has been in the past understood as an outlet, and what we are seeking for in the form of a spillway. The plan for outlets, as it was originally contended for in the lower valley, was for a cut in the side of a levee or in the bank of the river which would take the water off in a different direction and necessarily operate to a certain extent to check the velocity of the current of the main river, and, perhaps, form a sedimentary bar below.

The plan we are advocating is merely this: You have built your levee up to a certain height; you have fixed the height of your levee at the highest point you think it is safe for the water to go without incurring great dangers. Then the question is, Is it better to take the chance of having the water go over there uncontrolled or is it better from an engineering point of view—and no one questions that—to have that controlled spillway constructed so that when the water reaches that point, if it does go over, instead of tearing everything to pieces it runs over a cement cap on the levee and runs off in a controlled wasteway and does no harm? That is particularly important to the city of New Orleans for this reason, which I am only going to refer to very briefly, because Mr. Walter Parker, representing the chamber of commerce, is here and desires to be heard upon that point; that point is the interference to the commerce of New Orleans which results from the river rising to a height which interferes with the proper landing of the ships going up and down the river. That is a very serious question for a long period of time, as in the flood of 1912, from the standpoint of carrying on the ordinary commerce of the city. In other words, in the flood of 1912 the flood went to 22 feet. The flood this year stood two or three weeks at 21 feet. A flood of that height in New Orleans is a serious menace to the carrying on of the shipping and commerce and ordinary business of the city. Now, if by lowering that flood a few feet over a spillway the city of New Orleans, with all its immense shipping interests, can be entirely relieved of that menace, it seems to me that it ought to be something that would appeal to everybody as a thing that ought to be done—not by and by in the far future, but immediately. The clause I wanted to read with reference to the Mississippi River Commission is from an article appearing in the Times-Picayune, of New Orleans, on February 20, 1916, from which I quote the following:

‘Away back in the commission’s early history a special committee consisting of its then president, Col. C. B. Comstock, O. H. Ernst, major of Engineers,

Henry Flad, civil engineer; and Henry L. Whiting, of the Coast and Geodetic Survey, having under consideration a report of the local district engineer (Capt. Mills), reported on this spillway proposition in a communication to Brig. Gen. Thomas L. Gasey, Chief of Engineers, United States Army, which read as follows:

"Concurring in the inadvisability of an attempt to create new outlets from the Mississippi River which shall be large streams at all stages of the river, we do not wish to be understood as condemning the use in the levees of long waste weirs to take off the top of the flood if it shall be found that at certain places in the lower part of the river the further increase in flood flow which will come from raising the levees at points farther up the river can be controlled in whole or in part by such waste weirs more economically than by higher levees."

Judge Taylor, in an address in this city before the Mississippi River Improvement and Levee Association on October 28, 1903, after condemning the "outlet" as a delusion, said:

"There is a kind of outlet, however, which might be employed on the lower part of the river with advantage, in my opinion. It would be an outlet to take off a carefully controlled discharge from the very top of an extreme flood, and no more."

The Mississippi River Commission, in its report for 1910, page 2938, said:

"The increased elevation of the flood height is the result of the general confinement of the flood discharge by the levee system as a whole."

And in its report for 1912, page 2732, the Mississippi River Commission said:

"Defective foundations may exist far below the base of the levee in strata of sand, through which the water percolates, and when the head of water in the river becomes sufficiently great a break through the surface soil occurs, and the result is a sand boil which may cause the levee to collapse with little or no warning."

Now, you see it is not only a question of controlling the floods more economically. It is a question of constantly raising the levees to meet the steadily increasing flood heights, which at the same time increases the danger of crevasses resulting from defective foundations, like the Hermelia and Salem crevasses.

In New Orleans, I think it was in 1882, the highest water they had was 16 feet and it has gone steadily up to 22 feet. Now, it is seriously proposed to close the outlet into the Atchafalaya entirely, which would raise the water, according to this report, below Old River, 4 feet. You can readily see that when the river is up to 21 or 22 feet and the shipping of the river is seriously interfered with and its safety endangered a proposition which would raise that 1 or 2 feet, where it would go over the wharf levels, is a very serious matter for the city of New Orleans. It is not a thing which should be considered lightly or simply brushed aside because some particular member of the Engineer Corps might have an idea that raising the levees instead of building spillways is the advisable thing to do. We feel that there is very likely to be a change of mind upon that, as there has been before, in the history of the world as to matters upon which very fixed opinions were once held.

We may assume, I think, that there is to be no divorcement between the Mississippi and the Atchafalaya, and it becomes a question only whether the outlet into the Atchafalaya, which, if properly controlled, would be a spillway, shall be left in its present absolutely uncontrolled condition, and used as an outlet, without, at the same time, making any provision whatever for the protection of those people down through that Atchafalaya country who have been damaged by a use of the Atchafalaya outlet, because it is a benefit to the lower river to have this Atchafalaya River carry the excess flood waters. The position that we take is that the Atchafalaya work can not be done, of course, without a survey. No one claims

that it could. But we want the same obligation imposed upon the Mississippi River Commission with reference to making a survey of the Atchafalaya that exists with reference to any part of the main river. Am I correct in my statement of that, Mr. Martin? You live in that country.

Mr. MARTIN. Yes.

Mr. MAXWELL. And I think Mr. Wilson also lives in that country and can speak for the people there perhaps better than I can.

In addition to that, assuming that this outlet has been controlled and permanently established by proper structures, of course the conditions in the lower river are very much safer than they otherwise would have been, and if this Atchafalaya outlet is supplemented by these lower wasteweirs into Lake Maurepas or Lake Pontchartrain and Lake Borgne, New Orleans will be absolutely safe and absolutely relieved from the present menace to its shipping, in spite of this constant danger of very high water in the river.

What we ask with reference to those spillways or wasteweirs is that the Mississippi River Commission shall be required by the statute itself to accord to the people of that country an opportunity to come before them and fully present their case, and that if the Mississippi River Commission decides that the work should be done, as we believe they will when it is presented from this point of view, they should have the authority to go right ahead with it as a part of the general plan, as a part of the approved project, as a part of the Mississippi River work. We want this Atchafalaya project included, and we want the spillways included as a part of the general plan.

It should be included and approved so that when the plan is approved it will be all one project. The Newlands-Broussard bill absolutely covers that whole situation, so far as the status of the Atchafalaya proposition and the wasteweirs is concerned. It goes further than that, and as we think creates a system of handling the Mississippi River valley flood problem, which must inevitably be adopted, no matter whether this levee and revetment and spillway and wasteweer and Atchafalaya controlled outlet proposition is adopted or not. The entire completion of that project for the improvement of the main Mississippi River would not do away with the necessity for the general plan which contemplates the control of the floods on all the side tributaries and upper tributaries of the main river; so that in addition to controlling the flood between levees in the lower valley of the river you can absolutely guarantee that at Cairo there will never be an amount of water coming down that might by any possibility gorge between the levees and overflow at any point above Cairo or at any point below. You would fix a gage level at Cairo beyond which the river would never be permitted to go, and on the river below Cairo the level of the floods would be correspondingly reduced at every point on its course.

The Newlands-Broussard river-regulation bill coordinates all the different parts of the National Government, and this great plan never can be carried out unless a measure is passed providing for that coordination and extending equal recognition to each of the four coordinated departments of the Government: War, Interior, Agriculture, and Commerce. Each of the different departments of the Government dealing with this question is at present working

along without any knowledge, so far as the law requires, of what the others are doing. The Forest Service is doing a part of the work, the Reclamation Service is doing a part of it, the War Department is doing a part of it, the Geological Survey is doing a part of it, and while in a friendly they undoubtedly keep posted more or less, each of them, as to what the others are doing, there is not that formal executive coordination that there should be.

The Newlands-Broussard bill provides for cooperation with the States and districts and municipalities, making it possible to cooperate with the levee districts, but not demanding or requiring that any certain proportion of contribution must be made before the National Government can proceed.

On behalf of the State of Louisiana, Mr. Chairman and gentlemen, I want to call your attention to a point there which is very essential, and I wish to illustrate the point by the conditions existing between Arkansas and Louisiana: The State of Arkansas is not in as good a position, for various reasons, to cooperate with the Government as the State of Louisiana. Much of the water that comes down into Louisiana comes from Arkansas. It practically places every State at the mercy of every other State on any river, treating the Mississippi or the Ohio or the Colorado as a unit, to say that each and all of the States must agree to do some special thing that is required of them before work can be begun, wherever it is necessary to treat the river as a unit. In other words, to say that you must have the cooperation of Utah, Wyoming, and Colorado before you can deal with Colorado River in California and Arizona is to say that you can never deal with it in California and Arizona. To say that before you can do what is necessary to take care of the Mississippi River levees between Helena and the Gulf, you must have the consent and financial cooperation of every part of the Arkansas district is to say that the people of Louisiana would be unable to carry through or to have carried through the necessary works for the protection of Louisiana.

In this matter I do not speak only for the people of Louisiana. I think I can properly speak for the people of the whole country, because the association I represent has a membership extending over the entire United States. I think that the feeling amongst the general masses of the American people who are interested in and familiar with this subject is that the Mississippi River is the Nation's waterway, and that whatever is necessary to take care of the main-trunk channel of the Mississippi River from Cairo to the Gulf of Mexico should be done with an absolutely free hand by the National Government, without being tangled up with the necessity of making a single deal with a levee board, or a State, or a municipality, upon any specific basis of contribution. That is a thing which should be left to the properly constituted executive agency or authority of the National Government to decide in each case as to what that contribution should be, so that their hands would not be tied in any proposed work by any neglect or arbitrary attitude on the part of any local board or interest. That is one of the things that we have always felt constituted one of the greatest elements of strength in this Newlands-Broussard river regulation bill, that it provides for cooperation, it provides for contribution by the States and districts, but it does not

tie the hands of the National Government and compel it to say, "We can do nothing unless a certain State or a certain district or a certain municipality makes a certain contribution. Such a contribution might be withheld merely to force the National Government to do things it ought not to do.

Taking the question of coordination, that is fully provided for in the Newlands-Broussard bill, and we most respectfully submit that it should be provided for in any bill coming from this committee.

The CHAIRMAN. Just one second, on the matter of local contribution. Suppose we should report a bill that did not require local contributions, and authorized the commission to do the work, but without requiring local contributions. Do you think we would get local contributions?

Mr. MAXWELL. My suggestion about that, Mr. Chairman, is that it does not make any difference how strongly you put that provision as to contribution, if you do not tie the National Government up to an absolute basis of contribution, or make it impossible for it to proceed to build this great national waterway if some levee board fails to do something.

The CHAIRMAN. You would leave that open?

Mr. MAXWELL. I would leave that open for the commission to determine.

The CHAIRMAN. For the moment?

Mr. MAXWELL. We should at all times recognize the fact that conditions may arise where it might be that you would want to go right ahead, as I think you will find you might want to do as to the work between Helena and the Louisiana line; go right ahead and build it without reference to whether or not you get contributions. I think you might find that it was so necessary to protect the people of that part of the Mississippi Valley and below, that that should be done, and that you would find you were hampered in a very unfortunate way if you had to wait for local contributions. On other rivers there are many complications of that kind, but I am not going to take up the time of the committee with that.

Mr. CURRY. Do you think there is any part of the United States that would be benefited by this work whose local people would refuse to contribute their share?

Mr. MAXWELL. That is something you can not fix arbitrarily in advance.

Mr. CURRY. Oh, no.

Mr. MAXWELL. All I am urging is that they should contribute their share, and that you should not undertake to arbitrarily, in advance, by congressional enactment, fix the proportion of that share. That is something which must be worked out according to the peculiar conditions with reference to each project, and that is something which should be left entirely in the judgment of the commission, which should be the supervisory executive power in this work.

Mr. CURRY. Still you do believe that these local interests should contribute according to the local benefit derived?

Mr. MAXWELL. I not only believe they should contribute, but I believe that the fact that the Government is willing to go ahead and do things provided they contribute will be a tremendous influence to bring about that contribution, but, I think it would defeat its

purpose if the legislation enacted tied the hands of the national authorities by making arbitrary requirements as to an amount.

Mr. WILSON: Would you consider that the proper way to do that would be to leave it to the Mississippi River Commission and let it work it out and report it back to Congress, indicating the amount, fixing those proportions as recommended?

Mr. MAXWELL: We have been in hopes that Congress would be willing to leave those details to the commission. I do not see any reason why a commission constituted as is provided in the Newlands-Broussard bill, or constituted as was provided in the interdepartmental report on the Newlands bill, should not be intrusted to exercise its best judgment in such matters. It is really a matter of judgment upon a multitude of details upon which it is impossible to advise Congress in any general way. I think that clause in the Newlands-Broussard bill is as near right on that point in a general way as it is possible to get such a provision. Of course I do not mean to say that the phraseology is absolutely perfect.

This is the provision. It is entitled "Cooperation with States, municipalities, and other agencies," and is as follows:

SEC. 3. That the board of river regulation shall, in all cases where possible and practicable, encourage, promote, and endeavor to secure the cooperation of States, municipalities, public and quasi public corporations, towns, counties, districts, communities, persons, and associations in the carrying out of the purposes and objects of this act, and in making the investigations and doing all coordinative and constructive work provided for herein; and it shall in each case endeavor to secure the financial cooperation of States and of such local authorities, agencies, and organizations to such extent and in such amounts as the waterways commission shall determine to be a just and equitable apportionment of work, costs, and benefits, under all the circumstances, in each case; and it shall negotiate and perfect arrangements and plans for the apportionment of work, cost, and benefits, according to the jurisdiction, powers, rights, and benefits of each, respectively, and with a view to assigning to the United States such portion of such development, promotion, regulation, and control as can be properly undertaken by the United States by virtue of its power to regulate interstate and foreign commerce and promote the general welfare, and by reason of its proprietary interest in the public domain, and to the States, municipalities, communities, corporations, and individuals such portion as properly belongs to their jurisdiction, rights, and interests, and with a view to properly apportioning costs and benefits, and with a view to so uniting the plans and works of the United States within its jurisdiction, and of the States and municipalities, respectively, within their jurisdictions, and of corporations, communities, and individuals within their respective powers and rights, as to secure the highest development and utilization of the waterways and water resources of the United States: *Provided, however,* That the control of the Mississippi River shall be regarded as a national problem, imposing an obligation which alone can be discharged by the General Government for the preservation of the depth of its water for the purpose of navigation, the building of levees to maintain the integrity of its channel, and the prevention of the overflow of the land and its consequent devastation, resulting in the interruption of interstate commerce, the disorganization of the mail service, and the enormous loss of life and property which has resulted therefrom, and that the Mississippi River shall be improved and developed as a national waterway, exclusively under the control of the Federal Government, and all work connected with the creation and maintenance of such a national waterway, including levees, revetments, bank-protective work, flood-water channels, outlets, spillways, and all work thereon herein contemplated or provided for, shall be done exclusively by and at the cost of the National Government.

The CHAIRMAN: Is it contemplated in this bill of yours that the local interests along the Mississippi River—the lower Mississippi—shall make a contribution?

Mr. MAXWELL. No; the wording of the clause in the bill is very similar to the Democratic platform in that respect. That is what I had reference to, Mr. Chairman, when I spoke of the fact that I think the country at large would accede without objection to a policy of the Nation to make that waterway the Nation's waterway and pay for it.

Mr. FOSTER. You mean that without regard to the local interests paying anything at all for the improvement of the lower Mississippi?

Mr. MAXWELL. The local interests have already contributed a very large amount.

Mr. FOSTER. I know that, but I mean contributing anything more.

Mr. MAXWELL. Yes.

Mr. FOSTER. You think that the Federal Government should pay all of it?

Mr. MAXWELL. I do not see any reason, if the question is one of the improvement of a navigable waterway, why the Federal Government should not pay all of it as much as it should pay for the entire cost of improving the Buttermilk Channel.

Mr. FOSTER. Is it a question of navigation, altogether?

Mr. MAXWELL. That depends. The question of the revetment of the banks is.

Mr. FOSTER. I know, but is that whole scheme one of navigation entirely?

Mr. MAXWELL. It is not entirely navigation; no. Of course not.

Mr. FOSTER. Is it not a work in which the local communities will be very much benefited?

Mr. MAXWELL. Yes; they will be benefited, undoubtedly, as they are by all river improvements.

Mr. FOSTER. I know, but other communities do not get the same benefit as the lower river would in this case, do they?

Mr. MAXWELL. I think in some cases they do.

Mr. FOSTER. Do you think so?

Mr. MAXWELL. Yes; in some cases. The fact is that so far as the New Orleans conditions are concerned the constant raising of the levees has really created the danger in the river below.

The CHAIRMAN. If it were made possible to protect from overflow the many millions of acres of land that are now subject to overflow in Louisiana, Arkansas, and the Mississippi Delta that would, however, greatly benefit New Orleans, I suppose?

Mr. MAXWELL. Yes; it certainly would, because all that territory in a commercial way is more or less tributary to New Orleans. It would also benefit St. Louis and other cities.

Mr. FOSTER. All those cities along the river would be benefited?

Mr. MAXWELL. Yes; there is no doubt of it.

Mr. FOSTER. The Government would spend how many millions down there?

Mr. MARTIN. \$45,000,000.

Mr. FOSTER. \$45,000,000 or \$50,000,000; and it would make land worth two or three times that, would it not?

Mr. MAXWELL. That all depends. It is very hard to answer a general question like that. For instance, take the question of the Atchafalaya. The Atchafalaya originally had practically no head into the Mississippi River at all. The unfortunate conditions in the

Atchafalaya country are the outgrowth of comparatively recent years. They told me down in that country that there are people living there now who can remember when the school children crossed the Atchafalaya on a log at Melville, and to-day it is in the neighborhood of 700 feet wide and 60 feet deep there. That has been brought about by using the Atchafalaya as an outlet for the Mississippi to carry off the surplus flood water that has been brought down to that point between the levees instead of being permitted to spread out above so that it came back gradually into the river and to that extent minimizing the height of the floods in the lower valley. On the upper river below Cairo they have closed out the Arkansas Basin and the St. Francis Basin and other basins that were originally reservoirs, and they have drained millions of acres of swamps on the upper tributaries, which has turned the water into the river, as though it ran off a board, which originally came into the river slowly through the summer months. So there is a great deal to be said on both sides of that question, and therefore it is a question that I could not stand at this table and answer offhand.

I am reminded of the story that I once heard as told by Tom Reed about his examination when he was a young man about to be admitted to practice law at San Jose in California. He went before the court and the judge asked him if the Legal Tender act was constitutional. Reed answered without a moment's hesitation, "Yes, sir." The judge immediately said, "Young man, if you can answer a question like that so easily there is no doubt that you are competent to practice law." I could not answer that question about the Mississippi River offhand in that way, because there are so many compensatory and complicated conditions involved. If the State of Louisiana had been let alone, and no levees had been built at all on the river above, I question very much whether Louisiana would need to ask help from the National Government to-day. I think the amount which they have spent in Louisiana would have given them complete protection in the State of Louisiana without any further action by the Government. The danger of higher, and higher, and higher water is a result caused by the operations of the Government above.

The CHAIRMAN. Perhaps it would be a more accurate statement to say that if Louisiana had left the United States Government alone. The United States undertook the work in regard to the levees at the very urgent insistence of Mississippi and Louisiana.

Mr. MAXWELL. The trouble in Louisiana has been caused by draining the marshes above and gradually leveeing off the St. Francis and Arkansas Basins, and that began a good many years ago. They began more than two generations ago to drain the swamps of Ohio, Indiana, Illinois, Minnesota, and Iowa, and there are millions of acres left in the State of Minnesota that they are going to drain, still, and turn down the water into the Mississippi without any effort to equalize the flow in those States.

The CHAIRMAN. So far as I have been able to ascertain from my examination into the subject, extending long before the Civil War, I have not come to any evidence of any agitation of this question when those States down there were not insistent that the Federal

Government take part in it. I do not think that the Government forced it upon those people.

Mr. MAXWELL. I was under the impression that the agitation for national levees did not get into a shape that accomplished much of anything until Gen. T. C. Catchings, of Vicksburg, Miss., was in Congress, and that he convinced Congress that levees were necessary for the benefit of navigation, and upon that basis they got appropriations.

The CHAIRMAN. Gen. Catchings was elected in 1881. The Mississippi River Commission was created in 1879 as the result of a very active campaign by the Louisiana Representatives. They took the leading part.

Mr. MAXWELL. Yes; I do not question that.

The CHAIRMAN. Gen. Catchings was elected some years afterwards.

Mr. MAXWELL. But you go back to those early years and you find a steady accretion and higher and higher water from the work done on the upper river, and these appropriations were growing larger and larger each year. The point I made was that, in view of the large amount that Louisiana has already spent from local and State treasuries, it might be that a perfectly unprejudiced commission or court would find that they have already done their share.

The CHAIRMAN. I would not like to take issue with you on that point.

Mr. MAXWELL. I would not want you to take issue, because there is no issue.

Mr. FOSTER. I think it would be a very unusual thing if any Congress was seeking to force a lot of money on those people down there for improvements without their desire, without their having anything to do with helping to secure it. I have never heard of such a thing as that, and I do not think history would bear it out in any way.

Mr. MAXWELL. I do not think I have made my point clear.

Mr. FOSTER. I think it is a problem, and, so far as the river is concerned, I am for relieving it.

Mr. MAXWELL. I do not want to be misunderstood. I am not arguing that there should not be cooperation and coordination. I am arguing that it should be left to the discretion and judgment of the commission which should be created. That commission should not have to suspend its operations if met by a refusal to cooperate in any section of the river. If any particular levee district should not approve the plans of the Government, the commission should still have power to go ahead and do the things which it regarded as necessary.

Mr. FOSTER. Yes. I want to say this of those people, that from what little I have seen of them and know of them I believe those people down there are willing to cooperate and do everything they can with the Federal Government.

Mr. MAXWELL. I do not think there is any doubt about it.

Mr. FOSTER. To relieve that condition they will do everything they can do.

Mr. MAXWELL. But to say that they must cooperate on an absolutely arbitrary basis might be difficult to adjust.

Mr. CLINE. Of course, before we do anything it is necessary to agree upon a concrete system of administration.

Mr. MAXWELL. That is the most important thing of all.

Mr. CLINE. Yes; now, all the testimony we have had before this committee, or a very large part of it, by the engineers and members of the commission who are very modest, so far as that is concerned, is to the effect that this matter ought to be left wholly in the hands of the Mississippi River Commission.

Mr. MAXWELL. In so far as the river itself is concerned, from the point where their jurisdiction begins down to the mouth of the river, I do not understand that there is any serious objection to that.

Mr. CLINE. No.

Mr. MAXWELL. The solution of the problem as a whole requires study, and a right solution of the question requires that of entire drainage of the Mississippi River Basin shall be treated as a unit. The Mississippi and its tributaries cover 41 per cent of the entire area of the United States.

What we have attempted in the preparation and presentation of this bill that Mr. Rainey has introduced, which is known as the Newlands-Broussard river regulation bill, is that there should be an administrative machinery created, covering the entire United States. I believe that is so important, Mr. Chairman, that if a bill were passed by Congress creating that general machinery and vesting it with the authority which it would have under this bill, with the waterway commission at the top and some system of coordination of the different departments under that, the rest of the country would be perfectly satisfied to accept a comparatively small appropriation for emergency work like what is needed on the Sacramento River and the San Joaquin River and the Ohio River and others, and for the acquisition of the reservoir sites, as I said this morning, and would raise no objection to a very large appropriation at this time for the lower Mississippi River; but what the rest of the country seeks is the creation of this administrative machinery along some plan that will make it as practical to work it out as this Newlands bill does.

Mr. CLINE. You are getting away from the purpose of my inquiry; and that is, as to the Mississippi River proper from Cairo down. It has been agreed by the parties who have been before the committee that the Mississippi River Commission should have charge of that work, the necessary work to be performed to prevent flood conditions as we have them now?

Mr. MAXWELL. Yes.

Mr. CLINE. Now, you are asking the committee here, if it draws a bill, to include in that some auxiliary provisions, that the commission should take into consideration spillways and several other methods of relieving the flooded conditions. What is bothering me is this: If we leave this to the Mississippi River Commission that have already found levees and revetments are the only methods to successfully effectuate preventing floods, they have eliminated everything else, they have eliminated in the upper Mississippi, for instance, a reservoir system as an appropriate thing. I do not see how you are going, by incorporating into the bill these other methods, as auxiliary methods, to make your suggestions effectual.

Mr. MAXWELL. According to this bill, if the bill is as effective as this one proviso, the Waterway Commission would have authority to require the Mississippi River Commission should adopt these methods, and in any legislation that may be enacted there should be a national commission having power over every subordinate body like this Mississippi River Commission.

Mr. CLINE. Do I understand you to say that that commission should have authority over the Mississippi proper?

Mr. MAXWELL. Yes, sir.

Mr. CLINE. That would practically nullify any effect we might secure by appointing a Mississippi River Commission.

Mr. MAXWELL. No; the Board of Engineers has authority practically over them now. I do not know what the special phraseology might be.

The CHAIRMAN. No; you are mistaken about that.

Mr. MAXWELL. I do not mean it quite that way, Mr. Chairman.

The CHAIRMAN. Each particular survey here under a general law, of course, has to be referred to the Board of Engineers on Rivers and Harbors; but nothing that the Mississippi River Commission does on the Mississippi River has to be referred to the Board of Engineers.

Mr. MAXWELL. No; but this very matter, for instance, of the divorcement of the Atchafalaya, was referred to the Board of Engineers, and they do not agree with the Mississippi River Commission. Now, this is what we contend—

Mr. CLINE. My understanding is, and I not only have had the understanding for some time, but it has been gathered from the evidence adduced here before this committee, that the Mississippi River Commission is the ultimate authority for what shall be done and how the money shall be expended in the improvement of the Mississippi River.

Mr. MAXWELL. That is exactly what we want to get away from.

Mr. FOSTER. Do you want to take it away from the Mississippi River Commission?

Mr. MAXWELL. We do not want to take anything away from them, but we want a national commission created that would have power over them, so that if they should insist upon saying that New Orleans must remain subject to this menace of higher floods as it is subject to them to-day due, as we contend to the neglect of the Mississippi River Commission—

Mr. FOSTER. You want a supreme court?

Mr. MAXWELL. We want a right of appeal.

The CHAIRMAN. Whom would you have over that new commission?

Senator NEWLANDS. We want the national commission—the departmental commission—consisting of the secretaries of the four departments and distinguished engineers associated with them—

Mr. MAXWELL. That is it.

Senator NEWLANDS. To have the same control over the Mississippi River Commission that they would have over the Reclamation Service or the Forestry Service and every other service connected with water development.

Mr. MAXWELL. Yes, sir.

Mr. CLINE. Do you not think that the most competent, most efficient, body that could possibly be created to take care of the Mississippi River problem to-day is the Mississippi River Commission—

Mr. MAXWELL. Well, I should not want—

Mr. CLINE (continuing). Composed of the very best engineers we have in the country, who have given it years of study, gone carefully over all the plans, and arrived at certain conclusions? Do you not think they are the most capable body we could have?

Mr. MAXWELL. I am going to answer you very frankly. I do not think so. I think that the fact that they have recommended something right here which the board of engineers has not approved is the best evidence in the world that they made a great mistake.

The CHAIRMAN. Which one made the mistake there?

Mr. MAXWELL. I think the Mississippi River Commission made the mistake. Now, it is those things which make it inadvisable that the fate of a great city like New Orleans, with all its innumerable complicated commercial interests—it is the second city in the United States in the total of its exports and imports—should have its very existence remain subject absolutely without appeal to the arbitrary decision of the Mississippi River Commission.

Mr. CLINE. I tell you what occurs to me. The novelty of the whole proposition arises in my mind. For instance, if Mr. Baker, the new Secretary of War, should be put upon this commission and given superior authority over the Mississippi River Commission to investigate these propositions, when he has never given an hour's thought to it, his opinion should supervene, for instance, that of Judge Taylor, of Fort Wayne, who has been for 30 years on the Mississippi River Commission and has investigated it from every angle, and who is acknowledged to be one of the most able men on that subject in the country.

Mr. MAXWELL. And yet if you, a resident of New Orleans, had been struggling for years to get them to do something that in their own reports you found a recommendation for but which you could not get them to do, you would feel that you were right to take an appeal to Mr. Baker, the Secretary of War, and the other three Secretaries who are to constitute the Waterway Commission, rather than to sit down and have your home and your business and everything you possess in the world remain under the sword of Damocles all the time because of a determination of the Mississippi River Commission to do something in a different way from what the city wants done.

Mr. CLINE. I would want to take my appeal—

Mr. MAXWELL. You would certainly want to take an appeal.

Mr. CLINE (continuing). To a court of greater authority than the Mississippi River Commission is, if there is a possibility of getting that appeal.

Mr. MAXWELL. The position I am taking is not for any specific court of appeal, but for a court of appeal—

Senator NEWLANDS. The membership of that commission does not consist entirely of the Secretaries.

Mr. MAXWELL. No, sir.

Mr. FOSTER. You are a believer in the commission form of government? You want these commissions and these appeals from one

to another? Is that your idea, that we ought to have that kind of a government; just one commission after another, and appeal from one to another?

Mr. MAXWELL. I do not think that any board like the Reclamation Service, or the Forest Service, or the Mississippi River Commission ought to have arbitrary powers and rights over the property of the people in a community like the great city of New Orleans, without any possible opportunity for the people of that city to prove and show that the plans of the Mississippi River Commission are not right, and create a danger from which they refuse to do the things necessary to afford protection from that danger.

Mr. FOSTER. You do not believe, do you, that the Mississippi River Commission is unmindful of the interests of New Orleans?

Mr. MAXWELL. I certainly do.

Mr. FOSTER. You do?

Mr. MAXWELL. I certainly do.

Mr. FOSTER. Now, that is a remarkable statement.

Mr. MAXWELL. I was amazed beyond any possibility of human expression when I went to New Orleans and lived there through two great floods, that of 1912 and that of 1913, to find that the Mississippi River Commission had permitted those people to be placed in the condition of danger that they were put in by those floods. It was the most amazing and extraordinary thing that ever came under my observation, and I believe that the Louisiana Members of Congress will bear me out in that.

Mr. FOSTER. You think that the Mississippi River Commission is simply in such a condition of mind, and so on, that they have but little thought of the interests of New Orleans?

Mr. MAXWELL. I do not say that. They are wedded to certain theories, and it is as hard to break them loose from them as it was to convince people at a certain stage of the world's history that the world was round, or as it was for Harvey to convince the doctors of the fact of the circulation of the blood.

Mr. FOSTER. Are you an engineer?

Mr. MAXWELL. No; I am not an engineer; but I practiced law for a great many years and was employed in a great many cases involving the most complex engineering questions, and I was a trial lawyer and had to master hydraulic engineering question in my cases, just as well as the engineers who were employed to advise me, and I think I am as capable of forming a judgment with reference to, for instance, the necessity for these spillways or the necessity of fixing an absolute maximum flood level at the outlet of Atchafalaya as an engineer is; and when I know that the strongest and brainiest men in New Orleans think as I do, I have great confidence in my own judgment.

Mr. FOSTER. Then, if the engineers who have been on that river for years should differ with you, you would think they were wrong?

Mr. MAXWELL. Well, I would if they differed, but they do not seem to differ very much. They just refuse to do anything.

Mr. FOSTER. You said that they seemed to be unmindful of these facts.

Mr. MAXWELL. I really think so.

Mr. FOSTER. And of the interests of New Orleans?

Mr. MAXWELL. I think so.

Mr. FOSTER. I think that is a remarkable statement concerning a great city down there—that we all recognize is a great city.

Mr. MAXWELL. And entitled to consideration.

Mr. FOSTER. And entitled to consideration.

Mr. MAXWELL. Yes.

Mr. FOSTER. That you have a commission there which, by the way, has been in existence for 35 years, and yet that the engineers on that commission should feel that they will go along there and that the interests of New Orleans, as you look at it, are simply neglected?

Mr. MAXWELL. They are.

Mr. FOSTER. And that no thought is being given to the interests of the city?

Mr. MAXWELL. They are neglected because of the adherence to a single, fixed theory of flood control as to which, if you take the records and reports of the Mississippi River Commission themselves, you find paragraph after paragraph practically conceding enough to convince any unprejudiced person that the proposed plan for spillways as a modification of that fixed theory is correct and ought to be adopted.

Mr. FOSTER. I think if that is true we ought to bring the Mississippi River Commission before the Secretary of War and the President, or somebody else, and they ought to be given to understand that they are neglecting their duty down there.

Mr. MAXWELL. I think they are.

Mr. FOSTER. Is that proper?

Mr. MAXWELL. Yes; I think they are.

Mr. FOSTER. And they are not competent to fill the offices to which they have been appointed?

Mr. MAXWELL. There are a great many people in the Mississippi Valley who have stated that, but I am not here to repeat it.

Mr. FOSTER. And they ought to be impeached?

Mr. MAXWELL. A great many people have said that.

Mr. FOSTER. Is that it?

Mr. MAXWELL. A great many people have said it.

Mr. CLINE. As a practicing lawyer you have often found yourself differing from the Supreme Court?

Mr. MAXWELL. Yes; and I have sometimes succeeded in convincing the Supreme Court that I was right after they had decided the other way.

The CHAIRMAN. Mr. Maxwell, you are not entirely accurate, I believe, when you state that the Mississippi River Commission has absolutely the right to do these things, with no appeal to be taken from them to anybody higher. The plans have always been approved by the Chief of Engineers.

Mr. MAXWELL. I was under the impression that I had referred to that.

The CHAIRMAN. Those plans that they have adopted have been approved in that way, always. Now, as to that statement you made just now, that you believed the opinion of the people of New Orleans is shared in by the Representatives from that State, I did not know that. I have found, in my experience in the past 13 years with the Congressmen from Louisiana and the Congressmen from the city of New Orleans, that they were always cooperating with us in trying to procure appropriations to be expended under the Mississippi River

Commission, and, so far as I know, there has never been any demand from them that we change the commission or put anybody else over them. There has never been any thought or complaint, so far as I have heard, that the commission had been treating New Orleans in bad fashion.

Mr. MAXWELL. I will say this, that we are willing to forgive them for their past sins if they are willing to be converted now.

The CHAIRMAN. I suppose, if the sentiment is as overwhelming as you say, they will be converted.

Mr. MAXWELL. I think you will find there are very few Congressmen who are not in favor of these spillways, and also in favor of controlling the outlet of the Atchafalaya, who do not think that as it is used now it should be controlled.

The CHAIRMAN. Now, we have got back to the Atchafalaya. Suppose we should put a provision in the bill asking for a survey by the Mississippi River Commission to ascertain the cost of protecting the lower basin of the Red River and the basin of the Atchafalaya from overflow by some means other than a divorcement. Would that be satisfactory, or would you want us to say to them that they should make an investigation and report to us in favor of the spillway?

Mr. MAXWELL. They have already condemned the outlet proposition, and I do not understand that the people of New Orleans are contending for it. The only thing they contend for is spillways. They do not contend for anything else.

The CHAIRMAN. You do not catch my question right, I think. Aside from the people of New Orleans, let us now consider the others. Let us include the people of New Orleans and all the river below the mouth of the Atchafalaya, with the others. There are serious flood conditions in the lower basin of the Red River, and there are serious flood conditions in the Atchafalaya Basin. Everybody agrees that those conditions could be cured by a divorcement of the rivers, but that involves the hazard to other people, including the great city of New Orleans. Would it meet your views so far as the Atchafalaya—and also the Red River Basin—is concerned, now, if we should provide that the Mississippi River Commission should make a survey and an examination to ascertain the cost of protecting the Red River Basin and the Atchafalaya Basin from the flood waters of the Mississippi River by some means other than their divorcement?

Mr. MAXWELL. Well, I should hardly feel as though I ought personally to commit the people down there to anything like that by saying yes, without qualification. Senator Broussard is here and Mr. Martin is from that country, and Mr. Wilson is from that country. As to the exact form which the legislation should take, I think that I should rather refer that matter to them than to undertake to make any positive statement with reference to that part of it myself.

What I have undertaken to do, and all that I intend to undertake to do, is to make it clear to this committee that the legislation should be in such form, as we think it is now in the Newlands-Broussard bill, that this determined attitude of mind that concentrates on levees and revetments to the exclusion of everything else should be broken through, and that spillways should be *persona grata*, as it were, and that if they are going to leave the Atchafalaya outlet open, which I

think we must assume will be done indefinitely, then for the protection of the people down below along the Atchafalaya, and for the protection of the outlet itself, to prevent the whole Mississippi River from at some time going through there, it should be controlled. As to the exact form of the legislation, I do not know that I ought to undertake to say anything more definite than that.

The CHAIRMAN. That, of course, could not be done except in one way. There is no way for us by legislative enactment to guarantee that spillways or any other particular methods of flood control shall be persona grata to the Mississippi River Commission unless we find people in this country who believe that to be the right way, and put them on the commission, is there? What do you say to that?

Mr. MAXWELL. We would not ask—

The CHAIRMAN. Do you know any other way?

Mr. MAXWELL. There would be no question whatever about it if that matter were left to any unprejudiced commission selected to-day and not tied to historic prejudices with reference to the decision that would be reached.

The CHAIRMAN. At any rate, in your opinion, we should have a reorganization of the Mississippi River Commission, and put new men on there?

Mr. MAXWELL. Or direct the commission what to do; or create a national commission with power over the Mississippi River Commission—in other words, a court of appeals.

The CHAIRMAN. But that is not what you said. You want a legislative enactment here that will make spillways persona grata to the Mississippi River Commission. That being true, so far as we attempt to do anything, we will have to find out the opinions of the members who are to compose this commission before they are appointed.

Mr. MAXWELL. Oh, Mr. Chairman, I may not have been happy in making myself understood, but what we want with reference to the Mississippi River Commission is not that they should be required to build these things, but that they shall be required to take them up de novo, as just as much entitled to consideration as levees and revetments. For instance, suppose such a provision as this were inserted in the measure coming from this committee:

Provided, however, That the board shall forthwith consider the desirability and cost of relieving flood dangers by the establishment of spillways or weirs and the enlargement and maintenance of the existing outflow through the Atchafalaya River, together with the establishment of a system of levees for the protection of lands adjacent to the said Atchafalaya River: And provided further, That in the course of such consideration reasonable opportunity for hearings shall be given to representatives of municipal or other administrative bodies in territories now threatened by floods.

That is presented merely by way of illustration.

The CHAIRMAN. As to these hearings, has the Mississippi River Commission declined to give reasonable hearings to the citizens of New Orleans on this?

Mr. MAXWELL. They have declined to do anything. They have never been able to get them to do anything.

The CHAIRMAN. Have they declined to give any hearings?

Mr. MAXWELL. I do not know that I could say that. They have repeatedly and repeatedly condemned the idea.

The CHAIRMAN. Why do you want Congress to require that they be given these hearings unless the commission has refused them?

Mr. PARKER. May I say one word in there?

The CHAIRMAN. Certainly.

Mr. PARKER. Capt. Sherrill, who has been for many years studying the local situation at New Orleans, with whom we had many battles on this situation, finally reached the conclusion that spillways above and below New Orleans, in addition to levees and revetments, would safeguard that city from any further menace, and would fix the level of the water at 16 feet so that it would go no higher. That report was made to the Mississippi River Commission. I have tried repeatedly to get something out of the Mississippi River Commission as indicating what it intended to do in regard to Capt. Sherrill's report. I have failed. I have tried in conversation after conversation with Col. Townsend to get some expression from him. I have gotten none. That sheds some light on what Mr. Maxwell is now saying.

The CHAIRMAN. Let me ask you a question, Mr. Parker. Has the commission declined to give the people of New Orleans a hearing on this spillway?

Mr. PARKER. The matter has been formally put up to the commission by their own engineer at New Orleans by a favorable report which is just about as strong an argument as the people of New Orleans could possibly hope to present. That report is from their own engineer. We have not gone there as laymen and talked to them. No; because they have an engineering report in favor of the thing. We talked to the engineer.

The CHAIRMAN. The commission does give hearings at St. Louis and other places, does it not?

Mr. PARKER. Yes; and at New Orleans. They are perfunctory hearings aboard the ship.

The CHAIRMAN. They give hearings at St. Louis in the office. I have attended them myself. They did grant hearings, I know, to committees from the various parts of the valley, and I was just wondering if you had ever asked for a hearing.

Mr. PARKER. I have asked for just some indication as to what they were going to do with Capt. Sherrill's report, and I have not been able to get any further than that. Col. Townsend and I have been very friendly, but I have never been able to break the ice on that subject.

The CHAIRMAN. Of course, I hold no brief for any of them, but I should think that Col. Townsend might have no right to say what the commission was going to do until the commission did it, just as a court would probably not discuss with you beforehand how he was going to decide a case.

Mr. FOSTER. Have you asked them for a hearing?

Mr. PARKER. I have discussed the matter with Col. Townsend personally.

Mr. FOSTER. Have the people of New Orleans asked for a hearing?

Mr. PARKER. They have never, so far as I know, actually and formally asked for a hearing upon this subject; but we know that the favorable report from Capt. Sherrill is in the hands of the Mississippi River Commission recommending everything that we ask for.

Mr. FOSTER. But you have never asked for a hearing?

Mr. PARKER. I have gone——

Mr. FOSTER. Nor have the people of New Orleans asked for a hearing?

Mr. PARKER. I have gone to them personally.

Mr. FOSTER. Personally and talked about it?

Mr. PARKER. Yes.

Mr. FOSTER. Did they tell you that they would not consider that report?

Mr. PARKER. They did not tell me anything I could hang my hat on.

Mr. MAXWELL. The matter has been before them for about 20 years.

Mr. CLINE. Did you ever have engineers before him? Did you discuss the matter before him?

Mr. PARKER. No, sir; we were satisfied he was not going to do it.

Mr. MAXWELL. This matter has been before the Mississippi River Commission for years.

The CHAIRMAN. Their decision has been uniformly against it, as I understand.

Mr. PARKER. I do not understand that. I do not know that it has been against it specifically and positively, but it has always been of such a nature that it dropped dead and nothing could be done. You could not get anything done. I have something right here on that point.

Mr. FOSTER. Do you not think that if the Mississippi River Commission were informed that the people of New Orleans desired a hearing on this proposition, they would grant it?

Mr. MAXWELL. Will you answer that question, Mr. Parker?

Mr. PARKER. I have answered it.

The CHAIRMAN. We must have some justification as legislators if we put a direct provision in the statute that a board which gives everybody hearings must give certain people a hearing, because that would carry with it an inference that the board had refused to hear these people. Before we put that into legislation we must have something to hang our excuse upon. That is the reason we ask if they have refused a hearing.

Mr. FOSTER. Yes; because if they have refused it the people of New Orleans must have a hearing.

The CHAIRMAN. We are willing to do everything we can to see that you get a hearing, but before we legislate on it we want to know whether you have been denied a hearing. If so, we will have something to predicate our action upon.

Mr. MAXWELL. I am not aware that formal application has been made to the Mississippi River Commission for a hearing, for the reason that it is matter of common knowledge in that section of the country that the Mississippi River Commission has had this matter under advisement for years, and that upon every opportunity they have expressed themselves that the work should be confined to levees only, and should stop there. Now, Capt. Sherrill was not a member of the Mississippi River Commission, but was the Engineer of the United States Army in charge of that district office. In "Professional Memoirs, Corps of Engineers, United States Army, and Engineer Department at Large," volume 6, No. 25, for the

months of January and February, 1914, there is a most illuminating article by Capt. Sherrill, of the Corps of Engineers, entitled "The Port of New Orleans," and from page 35 I wish to read an extract, which is short, and which I think the committee will be interested to have read.

Now, you want to bear in mind, Mr. Chairman and gentlemen, that this is the statement of the Army Engineer in charge of that district, after he had been through the floods of 1912 and 1913 right there on the levees, and knew all about the experiences of those two floods and the danger that New Orleans is in from the conditions created by those floods. He says:

One of the greatest handicaps, even the greatest to New Orleans' growth, is the measure of the frequent excessive floods in the Mississippi, causing at times the city's level to be as much as 20 feet below the surface of the river, with only large-section levees (which are, in reality, wide mounds of earth) to hold back these waters. It speaks well for the energy of the people there that no portion of the city has ever been overflowed from the river. The experience of the recent highest floods on the river, namely, that of 1912 and the two of 1913, shows how dangerous it is to build levees closer to the river than about 200 feet. Previous to this time caving at high water was so exceptional that, in 1902, Maj. George McC. Derby was only able to find four cases of high-water caving up to that time. This year, on the contrary, at the highest and most dangerous stage of the flood there occurred a number of caves, two of the worst being at Poydras and at Harris Canal, each about 350 feet along the bank by 350 feet perpendicular to the bank, and both taking out the crown and a portion of the land-side slope of the levee. There are many places in New Orleans Harbor where such caves occurring would have brought disaster to the city and caused a complete inundation.

Gentlemen, I appreciate just as well as you do that I am not an engineer, and that no layman, perhaps, would have the weight with this committee that an engineer would have, but I am reading to you now the sober statement of the man who was in charge, representing the United States Government at New Orleans during those two disastrous floods of 1912 and 1913. I read further from page 36:

Notable instances of subsidences also occurred in the lower part of the city last fall, one of which completely destroyed the levee. Fortunately, this occurred at low water in October, thus allowing time for a new levee to be built before the January rise. In view of this fact, it can not be said that under present conditions New Orleans is ever entirely free from danger at flood periods and, as the levee system continues to be extended along the river, closing one by one the storage basins, the flood heights are steadily growing higher. A series of waste-weir spillways, allowing the discharge of the excess waters into the lakes in the vicinity of New Orleans, would add largely to the city's security and relieve the port of the necessity of raising the wharf floor lines. A survey for such waste weirs is now in progress under the Mississippi River Commission.

Mr. Parker can tell us whether anything further than that statement has ever come to the surface.

The CHAIRMAN. The only way to prevent the caving which is mentioned there, as I understand, is by revetment.

Mr. MAXWELL. You will find it right here in this article by Capt. Sherrill that you can not prevent what they call subsidence by revetment. You can prevent the erosion of a bank and consequent caving by revetment; but subsidence is caused by the pressure of water upon the strata. The water is forced back into the strata of fine silt or quicksand as the river rises, and then, when the river goes down, the hydraulic pressure being lessened, the tendency is to create a suction, which draws this fine silt or quicksand out into the river or

saturates it with water to such an extent so that it leaves no support for the bank, and then the bank goes down, and if there is a levee on the bank the levee goes down, too.

The CHAIRMAN. That is not revetment. You will find in this statement—and it is carefully explained here—that revetment will prevent the caving of an eroded bank.

Mr. MAXWELL. But it will not prevent a subsidence. If I had time to find that, I could find it in this article.

The CHAIRMAN. That is not our understanding of what the engineers have explained to us by a revetment. A revetment goes down from the low-water surface.

Mr. MAXWELL. Yes.

The CHAIRMAN. And it conforms to the irregularities of the shore all the way down.

Mr. MAXWELL. Exactly.

The CHAIRMAN. Now, these quicksand strata will be covered over by the revetment, which extends out several hundred feet. Then it extends from the low-water mark up the bank with riprap.

Mr. MAXWELL. Yes; but right there is a point which is a very important one. That revetment will prevent the current of the river from eroding the bank and causing the bank to fall in, to cave; but this subsidence, as they call it, is caused by the elimination of the material under the levee.

The CHAIRMAN. Absolutely.

Mr. MAXWELL. So that the levee drops right down, and revetting does not prevent that.

The CHAIRMAN. I understand that thoroughly. I have seen some trees on caving banks on the river go straight down—just sink right straight down. The Mississippi River Commission comes along and revets the bank, and that ends it.

Mr. MAXWELL. That might be so and it might not. It would depend entirely upon the nature of the bank that dropped down. The cave or subsidence at Lake Bruin is an illustration of that. That occurred this year, comparatively recently. The bank was revetted, but a very dangerous cave or subsidence occurred, notwithstanding the revetment, and at the last accounts I saw the cave had subsided to within 35 feet of the toe of the levee.

The CHAIRMAN. It was because the bottom had been sucked out of those lower strata, and the superstructure was saturated with water and became heavy and subsided. You call that subsidence. It just subsided. That is prevented uniformly along the river, so far as I am familiar with it, by revetment.

Mr. MAXWELL. Do not understand me as desiring to contradict you, Mr. Chairman, but my observation of the river has been that it is impossible to lay down any general principle with reference to that river and be sure you are right. For instance, take the Poydras break, which has been referred to. Something happened there which the Army engineers on the Mississippi River had up to that time said was practically impossible; and it was a very remarkable thing. The river was very high and there was a wide vatture or expanse of willow-covered ground between the river and the levee. The river guard walked along there about 4 o'clock in the morning and did not observe anything wrong. About 7 o'clock or a little later

a boy was going to his work along there, and found the whole vulture had sunk right in just as though you had taken a cheese knife and cut it out, the crown of the levee had gone in, and there was just a little rim of the levee left there.

Mr. CLINE. There was no revetment?

Mr. MAXWELL. No; but, of course, you can not revet the whole Mississippi.

Mr. PARKER. There was as much in front of that levee as anywhere on the river. The vulture was 620 feet wide.

The CHAIRMAN. Now, this may be a very good thing. I have no expression to submit. I would be entirely willing to accept Capt. Sherrill's opinion unless the other engineers differed with him.

Suppose that you do that and subsidence comes; then what?

Mr. MAXWELL. The very point of it is that if you reduce the flood level you minimize the dangers of such breaks. The spillways bring the maximum level of the flood down to a point where this hydrostatic pressure is never extended beyond a certain amount—a certain extent.

The CHAIRMAN. At my own town of Greenville, for instance, in the flood of 1913, I think it was, exactly that same thing occurred, and there was a cave-in there or subsidence, or whatever you call it, that took in half of the levee. It just split the levee there.

Mr. MAXWELL. Yes. I understood you to say that it was caused by a dynamite charge which exploded there.

The CHAIRMAN. No; that is what destroyed the revetment.

Mr. MAXWELL. Oh, yes.

The CHAIRMAN. Now, this went right down.

Mr. MAXWELL. That might have been a subsidence or might have been a cave. Of course, you and I do not know, and I do not know whether it is known by anybody.

The CHAIRMAN. Do I understand you to say that you would have subsidences as the result of the water if it was 4 feet higher than it is now, but would not have them if the water did not go above a certain level?

Mr. MAXWELL. The point is here: If your flood level is at 16 feet, we will say—

The CHAIRMAN. Yes.

Mr. MAXWELL. It establishes a regimen just exactly as a river establishes a regimen for which your levees and your substrata are tested year after year up to a certain point. Now, you come along and, we will say, after an interval of four or five years, you unexpectedly put 4 feet more hydrostatic pressure on the whole stratum there, and you can not tell what the result will be; and it is these pressures after interrupted intervals that create the danger. If you can hold the flood against the levee at a certain height, year after year, and never permit it to rise beyond that maximum flood level, you will have very little danger.

The CHAIRMAN. Let me ask you a question. Is that hydrostatic pressure that you speak of, that is augmented by 4 feet of water on top, what forces these caves or subsidences, or do they occur after the water goes down?

Mr. MAXWELL. They may occur after the water goes down.

The CHAIRMAN. A large one below the city occurred after it went down.

Mr. MAXWELL. The Jackson break occurred after it went down.

The CHAIRMAN. Because the fact is that the ground below there is thoroughly saturated with water, is it not?

Mr. MAXWELL. Yes, sir. Now, have I made myself clear there, that as the river rises there is an increase of pressure on all the resisting forces that confine the river and hold it in its channel? When the river begins to go down the influence is to draw everything toward the river, and the water that has been pushed out by hydrostatic pressure from above begins to come back toward and into the river, and the tendency, instead of being to hold back the bank, is to cave it in. That is why those disasters generally occur on a falling river. But the assumption that they will not occur on a rising river or at the highest point of the flood is one that has been shown to be unwarranted, because the Poydras break and the Harvey break in 1913 were of that character.

The CHAIRMAN. Oh, yes.

Mr. CLINE. It depends very largely on the character of the soil, does it not?

Mr. MAXWELL. Yes; it depends, you might say, most largely on that. It probably depends entirely upon that, because with some soils there is no possibility of a subsidence.

Mr. CLINE. As the river rises saturation becomes complete?

Mr. MAXWELL. Yes; if there is a lot of silt or quicksand, quite a lot of water goes back into it.

Mr. CLINE. And as the water comes back to the river as the river falls there is a gravitation of the water to the channel of the river?

Mr. MAXWELL. Yes; and the suction takes out the support or foundation which the levee had.

The CHAIRMAN. Do you think this particular question has been considered by the engineers of the Mississippi River Commission, who have been studying it for years?

Mr. MAXWELL. I hesitate to take up further time of the committee to go into that question as fully as I would like to do. I feel all the time that I ought to cut everything as short as possible.

Now, here are three columns of a newspaper article largely taken up with quotations from the Mississippi River Commission on this subject, showing that they have considered it from very many different angles; and here is quite a long quotation from Mr. Taylor.

The CHAIRMAN. Judge Taylor?

Mr. MAXWELL. Yes, sir.

The CHAIRMAN. Is it your idea that Judge Taylor does not concur in the opinion of the Mississippi River Commission that the way to control the floods on the lower river is by levees and revetments, is it?

Mr. MAXWELL. Well, I think Judge Taylor is very favorably disposed toward spillways.

Mr. CLINE. I will write him on the subject and get his opinion. He lives in my town.

Mr. MAXWELL. I wish you would, because I think he is very friendly to the idea of spillways. I will read from this article, which recently appeared in a New Orleans paper: "Judge Taylor, in an address in this city before the convention of the Mississippi Improvement and Levee Association in 1903, after condemning the outlet as a delusion," said what I will read here; and I hope I have made myself clear that we do not want an outlet as something that would cut the current of

the river down or change the current of the river, but what we want is a spillway that will not interfere with the current. Judge Taylor said:

There is a kind of outlet, however, which might be employed on the lower part of the river with advantage, in my opinion. It would be an outlet to take off a carefully controlled discharge from the very top of an extreme flood and no more.

There is quite a lot more of this, but I will not take up the time to read it. That is exactly what we ask for. I will ask that this whole article be inserted in the record of this hearing.

The CHAIRMAN. You understand that the committee is in no way opposed to that?

Mr. MAXWELL. I am glad to hear that, because I think that spells progress for us.

The CHAIRMAN. I am not. I do not think that the committee is in any way opposed to it.

Mr. MAXWELL. Then, Mr. Chairman, let me pray for your co-operation to find a way to get the Mississippi River Commission to do it.

The CHAIRMAN. But here is the point: It is perfectly evident from what Judge Taylor says there—I heard that address and I am going to ask you some more about it in a minute—it is perfectly clear that the commission had been giving this matter very careful study even in 1903 and prior to that time, and they have been at it ever since. I think this committee would hesitate, with its limited information on the subject, to undertake to tell the commission what they ought to do to control the floods on the Mississippi River.

Mr. MAXWELL. I do not think our request goes quite that far. We do not want you to tell them to do something else unless at the same time you tell them to do this. And we would also like to have the legislation put in such form that, without any regard to the general consideration of other people's feelings or anything of the kind, the people of New Orleans in this new legislation should absolutely have the right to go before that board and make these demands, because that is what they are equivalent to. Then, we do ask, further than that, that there should be a national commission created composed along the lines of this Newlands-Broussard bill, which creates a commission composed of the heads of the different Government departments and three or four experts appointed by the President, with power to exercise a supervisory authority over the Mississippi River Commission just as the Reclamation Service is under supervision, just as the Forestry is under supervision, just as the whole Geological Survey is under supervision. I fail to see any reason why one organization in the United States should be picked out and given absolute, automatic authority when none other has it.

The CHAIRMAN. You still forget, again, that their plans have heretofore been approved by the Chief of Engineers.

Mr. MAXWELL. In talking about the Mississippi River Commission, in my own mind I always include the Corps of Engineers of the Army, because they are just as hard to convert as the Mississippi River Commission, and perhaps a little harder.

The CHAIRMAN. There is one other question I should like to ask you, or, before I state that, I will ask, if you are laboring under this impression, which is held by a good many newspapers and a good

many people, that this committee is going to provide that this commission shall expend the entire appropriation on the construction of levees and revetments? If so, you are very much mistaken. The committee has not arrived at any conclusion like that, and I do not know of anything that would justify the conclusion that we are going to instruct them to spend it for levees and revetments. Speaking of Col. Taylor's address, you have perhaps seen the suggestion in the public press—I have, and in it some rather unfriendly criticism of myself—that the construction of levees has caused the Mississippi River to silt up and therefore become unfit for navigation; that in that way what has been for some reason or other termed "levee theory" has been carried on in the interest of the railroads for the purpose of destroying commerce on the Mississippi River. Have you seen in that address what Col. Taylor said about that theory?

Mr. MAXWELL. I have not read the whole of it. I do not think there is anything of that kind in it. I read this over rather hurriedly in Mr. Martin's office this morning.

The CHAIRMAN. He had a very interesting statement in that address on that subject, and I remember one expression he used. He said this idea has become very popular and that he has often wondered how so many people got that idea into their heads who had so few other ideas.

Mr. MAXWELL. Well, on that question, leaving out entirely the matter of opinion, because I do not agree with that at all, I was very much impressed with the statement of Mr. Cooley, and I do not think that Mr. Cooley's views can be whistled down the wind on a matter of this kind, because I think he is an engineer of the highest experience. He made the remark, as I recall it, that the original theory that confining the river between levees would cause it to scour and deepen its channel had not been borne out by actual experience; that where the levees are wide apart the tendency of the river, instead of being to deepen its channel, is rather to widen it, and make a river like the Platte, for instance, than a deep river like the Mississippi from the Red River to the Gulf.

The CHAIRMAN. Yes.

Mr. MAXWELL. Now I understand that many of the engineers—I do not state this as a matter I claim to know about, but merely as a matter of information—have practically accepted the theory that where levees are close to the bank they do have that effect.

The CHAIRMAN. They do have what?

Mr. MAXWELL. Have the effect of scouring the channel if you keep the levee right on the bank and increase the flow of the water and confine it, so that it is all practically a channel, that then you do not change the regimen so that you change the conditions of erosion. But where they put the levees back, as they do now, a long distance from the bank in order to save the levee from the danger of falling into the river, that there you make a completely different condition, and that the effort of the river there is to widen out and erode its banks rather than to deepen the channel.

Mr. CLINE. Where you widen the river out and retard the flow you consequently give the river a chance to deposit the sediment carried in the water?

Mr. MAXWELL. Yes; and where you hold the levees close to the banks you increase the velocity and increase the carrying power of

the river. Another point is that where you widen the river out and hold it for weeks over the soft sand banks, when the river goes down there is a caving or sloughage of the river banks and the caving away of a great amount of material from the river banks into the river, and which is brought into the river, that amounts, from Cairo to Donelsonville, to a billion and a quarter cubic yards which goes every year into the Mississippi River, a greater amount than was excavated to make the Panama Canal, and that huge amount of earth material goes into the river every year. The engineers have reported that there is no hope of ever maintaining a navigable river on the lower Mississippi until the question of the caving banks is corrected.

The CHAIRMAN. You still have not expressed your opinion as to whether or not the leveeing of the banks there has caused the river to silt up.

Mr. MAXWELL. I think it has above Old River. Just what effect it has had below that I do not know.

The CHAIRMAN. Would you mind stating what observations you base that on?

Mr. MAXWELL. My opinion in that respect is based not only upon my own study of the authorities but it is based on conversations with many men who have been familiar with the river for a great many years, like river captains, and a good many eminent engineers, like Mr. Cooley, who take that view.

The CHAIRMAN. Has Mr. Cooley ever expressed that view? I heard him make a statement the other day, and I did not understand that he did so. We have had him before us.

Mr. MAXWELL. I understand him to have expressed that view.

The CHAIRMAN. I have never heard him express that opinion.

Mr. MAXWELL. I got the impression from him that the river was not deepening—well, I think you can find confessions of that kind coming mighty close to admitting that in the reports of the Mississippi River Commission. I recall one now in which Col. Townsend did so. It was in a hearing before the House Rivers and Harbors Committee some two years ago. I could refer you to that.

The CHAIRMAN. I would like to have that very much, because whenever we have asked them a question, and in this report right here we have—

Mr. MAXWELL. I can give you the answer that that was expressed in his testimony two years ago, that there is an enlargement of the cross section, but not necessarily a deepening of the river.

The CHAIRMAN. Yes; but that does not answer the question. An enlargement of the cross section does not mean that the river has silted up. Now, for instance, we have here the last report by the Mississippi River Commission, in 1913. And we have heard here within a week in the statement of the engineers that it has not silted up, and that they have made innumerable soundings to ascertain whether it has or not and that for one reach of the river running 200 miles, where the levees had been maintained for a number of years, they have made 40,000 soundings to ascertain the truth of that theory, and that the tendency was rather to depress the bed of the river than to elevate it. But Mr. Cooley did say—I have his statement here—that revetment—and he so stated in his testimony yesterday—would,

in his opinion, certainly make the river 14 feet deep, and he believed 20 feet.

Mr. MAXWELL. I think there is no question about that. I remember very well talking with a river captain——

Mr. FOSTER. Ultimately it would lower the flood height?

The CHAIRMAN. Yes; ultimately it would lower the flood height; but, as Col. Townsend said, that would be so slow a process as to make it a matter of practical interest to the people of the twenty-fifth century, rather than to the people now.

Mr. MAXWELL. That is, depending on the channel.

The CHAIRMAN. That is, so far as controlling the floods was concerned.

Mr. MAXWELL. I want to make it clear, Mr. Chairman, that when you get above Old River I am not undertaking to controvert any of the opinions of the Army Engineers or anybody else about the Mississippi River, excepting as it might relate to source stream control, but these questions in the State of Louisiana are absolutely physical and are not technical at all. If you lower the level of the spillway into the Atchafalaya, and thereby lower the river to a certain point, the water that goes down the Atchafalaya is not going down the Mississippi, and the fact that the excess flood water is now going down the Atchafalaya now establishes the fact that it can go down there.

Mr. MARTIN. Will you state to the committee just how those spillways would work, to what extent we have to have spillways in order to relieve the conditions through the Atchafalaya?

Mr. MAXWELL. The general opinion is that there should be one spillway near Old River, one above New Orleans into Lake Maurepas or Lake Pontchartrain, and another below New Orleans into Lake Borgne. If these were built, it would make New Orleans comparatively safe.

Mr. MARTIN. What sort of spillways should they be?

Mr. MAXWELL. I think about 2 miles in width has been thought would be necessary. Of course that is a matter of engineering detail. As to the length of the spillway to hold the water at 16 feet, that is purely an engineering question. What the New Orleans people want is that a maximum flood height of 16 feet should be established, so that any steamer entering into the port of New Orleans will know that when she lands at the wharf she will have clearance for all her operations, without being up against a proposition of the river sloping the top of the bank or the wharf and that going up river she could go at ordinary speed, without danger of having the people on shore stand along the banks and shoot at the pilothouse, in order to recall to him the fact that the wash of his steamer is endangering the levees. I have a picture of a man shooting at the captain of one of the river steamers, an illustration of the way in which the flood encourages commerce of the Mississippi River.

The CHAIRMAN. Have you any information as to what would be the effect on those lakes of this spillway?

Mr. MAXWELL. On the lake?

The CHAIRMAN. Yes. That would be a crest of about 7 feet of water 2 miles wide.

Mr. MAXWELL. So far as the lakes are concerned, it would not make any difference if the water did go over there.

The CHAIRMAN. What do you mean when you say it would not make any difference?

Mr. MAXWELL. There would not be any harm done.

The CHAIRMAN. Not if it filled it up?

Mr. MAXWELL. It would not fill it up in a great many years. There would be many years when the water would not go over at all. It would be only in years of excessive height that water would go over. The idea would be to carry as much water as you could carry without danger to the city or danger to its commerce, and let the surplus, when it did go over, flow over a smooth surface, a cement crowned levee, instead of raging through a broken levee.

The CHAIRMAN. Would it tend to fill that lake up?

Mr. MAXWELL. Bonnet Carre crevasse ran into Lake Maurepas. Of course it would have a tendency in course of time to fill Lake Pontchartrain if it ran into that lake, but it does not seem to me it would do any harm if Lake Maurepas was filled up. It would be better to sacrifice some of the water space in Lake Maurepas than to utilize a part of New Orleans for a storage reservoir.

The CHAIRMAN. How about Lake Pontchartrain?

Mr. MAXWELL. It is practically an arm of the Gulf.

Mr. PARKER. We have a statement from Capt. Sherrill on that.

The CHAIRMAN. You have a statement from him?

Mr. PARKER. Yes. He told me that such a spillway would take the surplus water off. There being only silt in complete solution—the finer silt—there, and none of the heavy silt at all, it would be 100 years old before the effect would be really felt in Lake Pontchartrain.

The CHAIRMAN. That is what I wanted to know, because it has been suggested—I have not heard this question discussed for a long time, but I remember it was argued by Capt. Leathers many years ago, and it was argued that it would fill up Lake Borgne.

Mr. PARKER. Yes, sir. He said further that the sands that are most filling in their effects are the sands on the bottom of the river which are rolled. They are not in solution at all, but merely in partial suspension, and those sands would not go over that spillway at all.

Mr. MAXWELL. I think, Mr. Chairman, that covers the proposition so far as the Mississippi River is concerned. Capt. Crosby is here, who in former years was very familiar with the Atchafalaya River, and before the hearings are closed we would like to have the privilege of having him make a brief statement with regard to the Atchafalaya.

The CHAIRMAN. Capt. Crosby, would you prefer to make your statement this afternoon?

Capt. CROSBY. I am leaving, Mr. Chairman, at 4 o'clock this afternoon.

Mr. MAXWELL. Then we will have to ask for another day. Now, I wish to express my very great appreciation of the courtesy with which you have listened to me at such length, and if I can have a very few minutes more I will close my remarks.

Senator NEWLANDS. Mr. Maxwell, are you not going to cover the question of the upper river regulation?

Mr. MAXWELL. That is what I was going to talk about now.

The CHAIRMAN. They are getting pretty well down on the river and harbors bill in the House now, and we will have to go back to the floor.

Mr. MAXWELL. Perhaps Senator Newlands would prefer that I make my statement a little fuller than I can make it in the short time available to-day.

The CHAIRMAN. What did you wish to discuss?

Mr. MAXWELL. The question of the regulation of the headwaters of the rivers.

Mr. CURRY. Mr. Maxwell, the activities and the powers of the Army engineers are limited and circumscribed?

Mr. MAXWELL. Too much so.

Mr. CURRY. They can only do certain things.

Mr. MAXWELL. They are too much so.

Mr. CURRY. Do you think that a bill which we would report from this committee should be specific or elastic?

Mr. MAXWELL. Elastic.

Mr. CURRY. Still you think that we should include in this bill just exactly what should be done on the lower Mississippi?

Mr. MAXWELL. No. I tried to make my point clear. I think, Mr. Curry, that there is no question of difference between us on that point at all. The only thing we are urging with reference to the lower Mississippi River is that there should not be a limitation to revetments and levees.

The CHAIRMAN. Just repeat that again, please.

Mr. MAXWELL. That there should not be a limitation either in express terms or by leaving the Mississippi River Commission in such arbitrary control as they are to-day, where they have exerted that control and practically denied to the people of New Orleans this relief.

The CHAIRMAN. Just please explain exactly what you mean by that statement? That is, in general terms, and I would like to know how to write that in the bill.

Mr. MAXWELL. I think, Mr. Chairman, that it would rather be presumption on my part to advise the committee on that when there are two gentlemen from Louisiana on the committee, and Senator Broussard is right here and represents New Orleans himself.

The CHAIRMAN. But we would like to have it in rather more concrete form than that.

Mr. MARTIN. You gave it in writing a while ago.

Mr. MAXWELL. That was merely in reference to a hearing before the Mississippi River Commission. The most I could say at this time would be that this proposition of spillways should receive the same consideration from the Mississippi River Commission that the levees and revetments receive, and that they should have the same power, if they decide themselves, as I think they will if we get a chance at them square in the face, to build these spilways, to go right ahead and build them without coming back to Congress.

The CHAIRMAN. There is no limitation on their right to do that now.

Mr. MAXWELL. No; that is right; but they have refused for years to give to the people of New Orleans any satisfaction at all which would lead to actual construction.

The CHAIRMAN. They have refused to adopt that practice?

Mr. MAXWELL. Yes.

The CHAIRMAN. There is no way to require them to do that, unless we write it in the law that they must do it.

Mr. MAXWELL. As Capt. Sherrill has said in this article, I think that the floods of 1912 and 1913 had a very great influence on the minds of even the Mississippi River Commission and the Army engineers, and I think if the matter was taken up at this time, when we practically have a new deal all around, if we get a new bill coming out of this committee without any leaning to revetments and levees, and equally applicable to other things, we would come pretty close to getting it.

The CHAIRMAN. Now, once more; I want to see that our minds meet on this matter. Suppose the bill leaves out the verbiage which has heretofore been carried in river and harbor appropriations. I will have to repeat it from memory, because I have not the bill before me.

Mr. MAXWELL. Did you not read it this morning?

The CHAIRMAN. No; that was the original act under which they proceeded. They subsequently have adopted plans. At any rate, that legislation says that they may expend this money for revetments and levees. Both of those are mentioned in the bill.

Mr. MAXWELL. Then you should mention spillways; not requiring them to do it, but giving them the express power so that the levee, the revetment, and the spillway are in the same category.

The CHAIRMAN. Suppose we struck out levees and revetments, would that do?

Mr. MAXWELL. I should like to ask Senator Newlands and Senator Broussard and Mr. Martin for their judgment about that before I give mine. I think my judgment would be guided by theirs.

The CHAIRMAN. Then if in their judgment it will meet the situation by not mentioning levees or revetments—

Mr. MAXWELL. I think I might safely say that if Senator Broussard and Senator Newlands and Mr. Wilson and Mr. Martin were satisfied with any provision that this committee wished to put into the bill, I might safely assume in advance that the rest of us would be satisfied.

Mr. MARTIN. You mean anything giving general authority for all that is necessary to control floods?

The CHAIRMAN. Yes.

Mr. WILSON. I think we would want to know that they had authority to do it, and that there was no limitation against it.

Mr. MAXWELL. Yes.

Mr. WILSON. And, of course, we could not have a bill that would convince them, what we think they ought to do just by writing it in.

Mr. CLINE. We have got that now.

Mr. WILSON. There does not seem to be any doubt about that.

Mr. MAXWELL. And yet it is a strange thing that every time this matter comes up of levees and revetments and spillways are urged there is obstruction, and attention is devoted entirely to levees and revetments, ignoring spillways. We would like mighty well to see the word "spillway" in the bill.

Mr. WILSON. If you put that in that would not be any additional argument to the Mississippi River Commission that they should adopt it.

Mr. MAXWELL. It would be an argument for the adoption of the spillways.

Mr. CURRY. Do you not think authority should be given to do "all things necessary to control," and so forth?

Mr. WILSON. Something else might come up.

Mr. MAXWELL. Yes; but the Atchafalaya River ought to be mentioned.

Mr. CURRY. I understood you some time ago to read proposed specific instructions to the Mississippi River Commission.

Mr. MAXWELL. That was merely in regard to a right to a hearing.

Mr. CURRY. What is that?

Mr. MAXWELL. That was merely a suggestion that was made to me that they should give a hearing.

The CHAIRMAN. But you have never asked for one?

Mr. CURRY. You wanted those instructions written into the law? I so understood you.

Mr. MAXWELL. It would not do any harm if it was in there.

Mr. CURRY. Do you not think it would be a mistake to limit the powers of a commission of that kind as to what they may and may not do? A condition might arise in which something else would be necessary.

Mr. MAXWELL. That is possible, but I have a strong feeling that if the commission can be made to understand that this Flood Control Committee of the House of Representatives believes that the spillway is something which should receive equal study and consideration with revetments and levees, we will not have any more trouble. Just how that is to be brought about I am not prepared to say right offhand, and I do not believe there is a member of this committee who would not feel as the New Orleans people do if you were in their shoes.

Mr. FOSTER. I believe they are entitled to consideration of that sort.

Mr. MAXWELL. The quotation there from Capt. Sherrill's article shows what the Army engineer on the ground feels.

Mr. CLINE. Personally, I have not any feeling about the matter at all, because I have not sufficient information. I should like to see all these problems investigated by the commission, but I do not want to go so far, as a layman, as to set up my opinion against that of thoroughly equipped, expert engineers.

Mr. MAXWELL. No; and we do not want you to.

Mr. CURRY. Even under the present law, which we hope to liberalize, the people of New Orleans have a right to a hearing before the Mississippi River Commission and a right to appeal to the Chief of Engineers, because the Chief of Engineers has to approve all the plans.

Mr. MAXWELL. The Chief of Engineers has been our most troublesome opponent. The Chief of Engineers, Gen. Bixby, again and again and again gave out interviews to the public and stated everywhere that opportunity offered that the way to control the Mississippi River was by levees and revetments and nothing else.

Mr. CURRY. You can appeal from him to the Secretary of War.

Mr. MAXWELL. If you go to the Secretary of War, then the question arises that was referred to a while ago about Mr. Baker being an inexperienced man. So far as I know it is almost an impossibility to get the Secretary of War to overrule the Army engineers. It may be done and has been done in specific cases.

Mr. CURRY. I know it has been done.

Mr. MAXWELL. But it is a difficult thing to accomplish. I have an article here, dated February 20, written by Peter S. Lawton, reviewing all the expert opinions as to spillways for the control of the Mississippi River. I ask that that be embodied in the hearing.

The CHAIRMAN. Very well. If you have finished your statement, there are one or two things I want to ask you.

You have talked a good deal about spillways. It occurs to me that you ought to have had this hearing, so far as spillways are concerned, before the Mississippi River Commission. Nothing has been brought out here that would indicate to my mind that if a request were made to the Mississippi River Commission for a hearing it would be denied. No request has ever been made by the people of New Orleans for a hearing on this subject before the Mississippi River Commission. Now you want us to incorporate in our law a command to the commission that they hear you. I do not believe this committee would ever agree to that unless they could find out just who in the United States wanted a hearing and include everybody.

Mr. MAXWELL. I think, perhaps, that would be right. We do not want that.

The CHAIRMAN. We can not enumerate all the various communities and cities in the valley and say to them, "You must hear these." The only justification for that would be that the Mississippi River Commission had refused to hear them. If the people of New Orleans had asked for a hearing before the Mississippi River Commission, or if in the future they asked it, and the commission refused to hear them, then, I think, it would be time for Congress to take the matter up and do such things as would be necessary to get the desired relief.

Mr. MAXWELL. Yes.

The CHAIRMAN. I ask your opinion about that. Do you think that is a fact? Does that appeal to your judgment?

Mr. MAXWELL. It would if I had no knowledge of it other than what I might have gathered at this hearing; but the fact of the matter is that it is known to everybody in the city of New Orleans that for the last four or five years—ever since the flood of 1912—there has been a very decided cleavage between the Army engineers and the Mississippi River Commission on the one hand, and the people of New Orleans, who desired this enlargement of the policy with reference to the treatment of the river on the other hand; and a great many things have been given out by Gen. Bixby and by Col. Townsend in the papers here and there, in conversations, in publications, and in the papers, which has led to a sort of fixity of conviction that the Mississippi River Commission is opposed to everything but levees and revetments. Now, if you will pardon me a moment, we have come here to Washington with the idea that the whole thing is wide open and that we are going to get a clear oppor-

tunity for a square deal on the spillway question. Of course, that does not necessarily argue anything.

The CHAIRMAN. Just a minute before you get on that. Your position is that there is no use in having a hearing before the Mississippi River Commission because they are already fixed in their own opinion?

Mr. MAXWELL. I would not go that far.

The CHAIRMAN. I do not understand just what your general language means if it does not mean that.

Mr. MAXWELL. I was a court reporter once for a judge who dictated his opinions oftentimes to me. I knew a case where he dictated his opinion to me deciding a case one way and afterwards decided it the other way. There was not any reason for that except an entirely honest change of opinion in the mind of an honorable judge, and I think that the Mississippi River Commission and the Army engineers are gradually working over to a broader conception of this whole proposition.

The CHAIRMAN. Then why not ask them for a hearing?

Mr. MAXWELL. Of course that question really is not up now.

The CHAIRMAN. It was up in the amendment that you offered here which you wanted incorporated in the bill.

Mr. MAXWELL. The bill is now being formed. Now, what we want in the bill is not so much a provision for a hearing; what we want in the bill is that there shall be no preferential statement giving levees and revetments preference over spillways, and such further provision as may be necessary to give the Atchafalaya River exactly the same treatment as though it were one of the mouths of the Mississippi River.

The CHAIRMAN. All well and good. Now, I understand you. You do not want anything in the bill about hearings; so that ends that.

Mr. MAXWELL. That was suggested to me as something which might—

Mr. CLINE. Here is what Col. Townsend said on the 4th of June, 1913, in reply to an inquiry on the spillway subject:

I personally consider the question of sufficient importance to justify a careful survey.

You see that is a recent statement.

Mr. PARKER. He had a survey made.

Mr. CLINE. If he is open to that much of an investigation, he would not shut off any hearing, of course, if you wanted it.

Mr. MAXWELL. The fact remains that notwithstanding all the efforts made by the city of New Orleans for a great many years, there are no spillways.

Mr. CURRY. I had a survey ordered three years ago, and they are still surveying on it. I would be willing to have that go 50 years longer, if it was necessary, in order to get at the real facts of the case.

Mr. MAXWELL. That is a much more complicated proposition than this, when it comes to the surface of the river.

The CHAIRMAN. How long will it take you to conclude?

Mr. MAXWELL. I rather think Senator Newlands would like to have me go into the matter of the upper river regulation. Might I have 10 minutes on another day.

The CHAIRMAN. You are going to be here later?

Mr. MAXWELL. Oh, yes. I shall be here.

The CHAIRMAN. Then suppose you come back and talk to us about those matters on Monday.

Mr. MAXWELL. Very well.

At 5 p. m. the committee adjourned until Monday, April 3, 1916, at 10.30 o'clock a. m.

(The newspaper article and extracts submitted by Mr. Maxwell are as follows:)

[Extract from The Port of New Orleans, by Capt. C. O. Sherrill, Corps of Engineers, published in Professional Memoirs, Corps of Engineers, United States Army and Engineer Department at large, Vol. VI, No. 25, January-February, 1914, pp. 13, 15, 34, 35, and 36.]

Another notable feature of the South Pass improvement since the lateral openings were closed and the jetties built is that there has been a constant tendency for the channel depths throughout the pass to become much more uniform. Near the Head of the Pass and over the bar the scour has been extensive, while throughout the Pass itself there is extensive shoaling in the parts formerly deepest, giving an average depth of about 30 to 40 feet. This is an important fact, leading to the belief that levees improve the average condition of a channel, filling in excessive depths and scouring abnormal shoals. This, of course, would only hold true where the levees follow closely the low-water channel of the river, as is the case below New Orleans, and where the stream bottom is of soft material. At localities where there is no relation between the required channel capacity and the sectional area of high-water flow between levee lines, as is found above Bayou Sara, La., on the Mississippi, there does not appear to be the slightest effect produced on the channel by levees, for they have no influence in holding the current over the low-water thalweg.

An injurious effect of the extension of levee lines on the channel is that by restricting the flow to a small sectional area higher flood heights are caused and more extensive caving of the banks occur. This has been observed recently at the Head of the Passes, where extensive caving is occurring, with danger of permanent injury to the improvement works. Since the three high floods of 1912 and 1913 the bank caving is probably greater than ever before observed. Where local conditions, as near New Orleans, admit of it, waste weir outlets would reduce flood heights and be of resultant great advantage without damaging the channel, due to deposits of silt, as is claimed to be the result of natural outlets, since the waste weirs would automatically cease to operate at the desired elevation chosen for the weir crest slightly above bank full stage. (Pp. 13, 15.)

There are two distinct classes of faults of river bank found in the harbor, as well as generally on the Mississippi. One is known as caving and the other as subsidence. A caving bank is one that is gradually eroded below low water, and usually near the bottom of the bank, until the slope of the bank becomes too steep to carry the load. When this occurs there is a sudden shearing off of a large mass of earth which is precipitated to the bottom of the river, and a large part is then washed away by the current. These caves vary in size up to 1,000 to 2,000 feet long by 400 or 500 feet perpendicularly to the bank. On the lower river they rarely exceed 400 or 500 feet long by 400 feet inland, but even at that the necessity for adequate protection against subaqueous erosion is apparent. Bank subsidences are due to little known causes and are entirely independent of the erosion or slope of the lower bank. They often occur on a making bank and are accounted for as follows: The materials forming the river bank are entirely unhomogeneous, without persistent stratification or uniformity of material. There will be pockets of the hardest clay and others of fine silt so light that borings through them indicate practical voids. When these volumes of light material are near the bank there seems to be a tendency at low stage of the river for the subsoil water to percolate out into the river, carrying the fine silt with it. This continues until finally the volume contains so little solid matter that it loses its supporting power and the upper bank crushes down to fill the void. This character of disturbance has frequently occurred where the bank is stationary or making, and often where mattresses were intact both before and after subsidence.

Mattresses are only effective in preventing erosion of a bank. They have no strength to actively support an unstable one, and consequently with excessively

steep subbanks found in New Orleans Harbor at several places, notably Westwego and Carrollton, it will not be surprising to see in future, as has occurred in the past, some caves, and possibly disastrous ones. It can be said for the mattress work and spur dikes, however, that so far, since inaugurated about 1880, they have been remarkably successful in this harbor. Banks are being held here at slopes which would be considered impossible on the upper river in sandy soils, such as found in Giles Bend and other points.

One of the greatest handicaps, even the greatest, to New Orleans' growth is the menace of the frequent excessive floods in the Mississippi, causing at times the city's level to be as much as 20 feet below the surface of the river, with only large section levees (which are in reality wide mounds of earth) to hold back these waters. It speaks well for the energy of the people there that no portion of the city has ever been overflowed from the river.

The experience of the recent highest known floods on the river, namely, that of 1912 and the two of 1913, shows how dangerous it is to build levees closer to the river than about 200 feet. Previous to this time caving at high water was so exceptional that in 1902 Maj. George McC. Derby was only able to find four cases of high-water caving up to that time. This year, on the contrary, at the highest and most dangerous stage of the flood there occurred a number of caves, two of the worst being at Poydras and at Harris Canal, each about 350 feet along the bank by 350 feet perpendicular to the bank and both taking out the crown and a portion of the land-side slope of the levee. There are many places in New Orleans Harbor where such caves occurring would have brought disaster to the city and caused a complete inundation.

Notable instances of subsidences also occurred in the lower part of the city last fall, one of which completely destroyed the levee; fortunately, this occurred at low water in October, thus allowing time for a new levee to be built before the January rise. In view of this fact, it can not be said that under present conditions New Orleans is ever entirely free from danger at flood periods, and, as the levee system continues to be extended along the river, closing one by one the storage basins, the flood heights are steadily growing higher.

A series of wastewear spillways, allowing the discharge of the excess waters into the lakes in the vicinity of New Orleans, would add largely to the city's security and relieve the port of the necessity of raising the wharf floor lines. A survey for such wasteweirs is now in progress under the Mississippi River Commission. (Pp. 34, 35, 36.)

[Extract from *Farmers of Forty Centuries*, by F. H. King, p. 110.]

In the United States, along the same lines, now that we are considering the development of inland waterways, the subject should be surveyed broadly and much careful study may well be given to the works these old people have developed and found serviceable through so many centuries. The Mississippi is annually bearing to the sea nearly 225,000 acre-feet of the most fertile sediment and between levees along a raised bed through 200 miles of country subject to inundation. The time is here when there should be undertaken a systematic diversion of a large part of this fertile soil over the swamp areas, building them into well-drained, cultivable, fertile fields provided with waterways to serve for drainage, irrigation, fertilization, and transportation. These great areas of swamp land may thus be converted into the most productive rice and sugar plantations to be found anywhere in the world and the area made capable of maintaining many millions of people as long as the Mississippi endures, bearing its burden of fertile sediment.

RESOLUTION OF THE LOUISIANA BANKERS' ASSOCIATION.

[Adopted at the annual meeting of the association, Apr. 27, 1912.]

Whereas a bill was introduced in the Senate of the United States by Senator Newlands on March 1, 1911, entitled, A bill to create a board of river regulation and to provide a fund for the regulation and control of the flow of navigable rivers in aid of interstate commerce, and as a means to that end to provide for flood prevention and protection and for the beneficial use of flood waters, and for water storage, and for the protection of watersheds from denudation and erosion and from forest fires, and for the cooperation of Government

services and bureaus with each other and with States, municipalities, and other local agencies; and

Whereas the primary purpose of said bill is to bring into conference and cooperation the National Government with the States, municipalities, counties, and local districts for the construction of the works necessary for the regulation of the flow of rivers and for flood prevention and protection, and provides a fund of \$50,000,000 annually for 10 years for said purposes; and

Whereas the passage of said bill by Congress would result in the relief, not only of Pittsburgh but of all cities and communities on the Ohio, Missouri, and Mississippi Rivers from destructive floods and increase the flow of the rivers in the low-water season for navigation: Now, therefore, be it

Resolved, That the Louisiana Bankers' Association hereby indorses said Newlands river-regulation bill and requests the Senators and Congressmen from this State to urge its passage by Congress.

FLOOD-CONTROL POLICY OF THE LOUISIANA RECLAMATION CLUB.

[Resolution adopted by the Louisiana Reclamation Club at a meeting of the club held Tuesday, May 14, 1912.]

Whereas throughout a wide extent of country that is comprised within the trade territory of New Orleans the great flood of 1912 in the Mississippi Valley has made thousands homeless, ruined crops, drowned live stock, destroyed buildings and improvements, and will seriously retard the advancement and development of that territory; and

Whereas every business man and property owner in New Orleans will feel the loss from this great disaster in a decreased volume of business, deferred collections, reduced property values, stagnation of trade, and lessened demand for real estate; and

Whereas the danger of a recurrence of such disasters is a menace to the property, growth, and development of New Orleans, and such danger can only be permanently removed through the adoption by the Congress of the United States of a broad national policy under which the Federal Government will in future guarantee protection against overflow and by taking over and maintaining the levee systems as national fortifications against invasion by the destroying forces of nature, just as it now maintains military and naval forces and builds fortifications as defenses against foreign invasion; and

Whereas the construction of the great engineering works and reservoirs that would store the floods of the Ohio River and thereby aid in affording protection from overflow in the lower Mississippi Valley is warranted by the benefits therefrom to the Ohio Valley alone on flood prevention, incidental power development, and navigation, and a similar policy is likewise justified in the Missouri Valley for the same reasons, and also because the water there may be used for the irrigation of millions of acres of arid lands; and

Whereas in no possible way can the construction of such works for head-water control of the floods in the territory of their origin do otherwise than benefit the lower Mississippi Valley by regulating the flow of the river and thereby improving it for navigation, and giving additional security and protection against floods; and

Whereas the steadily increasing volume and rising flood plane of the floods in the lower Mississippi Valley has been largely caused by the changed conditions of the watershed in the States comprising the drainage basin of the Ohio, upper Mississippi, and Missouri Rivers, and those conditions and causes are beyond the control of the States bordering the Mississippi River from Cairo to the Gulf, and can only be controlled by the Federal Government: Now, therefore, be it

Resolved, That the Federal Government should immediately extend such temporary relief as may be necessary to repair the broken levees and to maintain them in future, and to control the river in its channel by revetments and bank protective works which will safeguard against the destruction of levees by caving banks and shifting channels.

Resolved further, That in working out plans for flood prevention and the protection of the lowlands of the Mississippi Valley from overflow the Mississippi River and all its tributaries and source streams should be treated as a unit, and a comprehensive and adequate levee system, to be permanently maintained

by the National Government, should be supplemented by a system of reservoirs on the headwaters of the Ohio and its tributaries, and also on the upper Mississippi, and by a system of flood-water canals and storage reservoirs in the Missouri River Valley, by means of which the flood plane at Cairo would be at all times so reduced that no combination of high water in the three upper rivers would ever create a great flood in the lower Mississippi Valley, and at the same time prevent overflow and damage by floods in the valleys of the Ohio, the upper Mississippi, and the Missouri Rivers.

Resolved further, That the Nation can not longer afford to permit its resources of soil, of power, of water, and of navigation to be carried as a wasteful and destructive flood to the sea, and that since the States themselves can not, in the general interest, prevent this waste, the Federal Government should conserve such floods at their sources and subject the now wasted waters to beneficial use.

Resolved further, That the Louisiana Reclamation Club hereby indorses and approves the resolution of the Pittsburgh Chamber of Commerce adopted on April 13, 1911, indorsing the Newlands river regulation bill and urging its passage by Congress; and

Resolved further, That the business men and property owners of New Orleans be, and they are hereby, urged to extend their hearty personal cooperation and financial support to the Louisiana Reclamation Club in its work for the organization of a national campaign through the National Reclamation Association to accomplish the early passage of the Newlands river-regulation bill by Congress.

JOINT RESOLUTION.

[Concurred in by Senate and House, Louisiana Legislature, June 6, 1912.]

Whereas the great flood of 1912 has demonstrated that the National Government only can obviate a recurrence of such overflow disasters in the future by a national policy under which an adequate levee system will be built and maintained as national fortifications against invasion and destruction by the forces of nature; and

Whereas the steadily increasing volume of the floods in the lower Mississippi Valley has been largely caused by the changed condition of the watershed in the States comprising the drainage basin of the Ohio, upper Mississippi, and Missouri Rivers; and

Whereas these causes and conditions are beyond the control of the States bordering the Mississippi from Cairo to the Gulf, and can only be controlled by the National Government: Now, therefore, be it.

Resolved by the House of Representatives of the State of Louisiana, the Senate concurring therein, That the National Government should immediately extend such temporary relief as may be necessary to repair the broken levees and to maintain them in future, and to control the river in its channel by revetments and bank protective works which will safeguard against the destruction of levees by caving banks and shifting channels.

Resolved further, That in working out plans for flood prevention and the protection of the lowlands of the Mississippi Valley from overflow, the Mississippi River and all its tributaries and source streams should be treated as a unit, and a comprehensive and adequate levee system, to be permanently maintained by the National Government, should be supplemented by a system of reservoirs on the headwaters of the Ohio and its tributaries, and also on the upper Mississippi, and by a system of flood water canals and storage reservoirs in the Missouri River Valley, by means of which the flood plane at Cairo would at all times be so reduced that no combination of high water in the three upper rivers would ever create a great flood in the lower Mississippi Valley, and at the same time prevent overflow and damage by floods in the valleys of the Ohio, the upper Mississippi, and Missouri Rivers.

Resolved further, That the Nation can not longer afford to permit its resources of soil, of power, of water, and of navigation to be carried as a wasteful and destructive flood to the sea, and that since the States themselves can not, in general interest, prevent this waste, the Federal Government should conserve such floods at their sources, and subject the now wasted waters to beneficial use.

RESOLUTION OF THE POLICE JURY OF THE PARISH OF MOREHOUSE, LA.

[Extract from the minutes of the January (1913) meeting of the police jury of the parish of Morehouse, La.]

Whereas there has been introduced in Congress by Senator Newlands a bill for regulation and control of the flow of navigable rivers, etc.; and

Whereas the National Reclamation Association, which met in New Orleans on the 6th of this month, passed unanimously resolutions requesting our Senators and Members of Congress to assist in having the amendments adopted at said convention in New Orleans incorporated in the Newlands bill before its final passages: Now, therefore, be it

Resolved by the police jury of the parish of Moorhouse, La., That Senator Joseph E. Ransdell and Representative Walter Elder, as well as our junior Senator and other Representatives in Congress, be earnestly requested to give all the aid and encouragement possible to the passage of the said Newlands bill as so amended by said Congress in New Orleans, and that a copy of this resolution be sent to Senator Ransdell and Representative Elder.

(Signed) L. N. POLK,

President Police Jury Parish of Morehouse.

A true copy.

WM. M. TAYLOR, *Clerk.*

RESOLUTIONS.

[Unanimously adopted by the Louisiana constitutional convention, Nov. 10-22, 1913.]

Whereas it is the sense of this convention that the control of the flood waters of the Mississippi River and its tributaries, as well as the navigable streams throughout the United States, is a national problem and a national duty, the Federal Government with its vast resources should come to the relief of the people who suffer therefrom by assuming responsibility for the effective control of such waters, and that only a general system treating the rivers of the country will be adequate or satisfactory to the people of Louisiana and other interested States; and

Whereas this convention adopts and affirms the declaration of the national Democratic platform of 1912 in favor of the cooperation of the United States and the respective States in plans for the comprehensive treatment of all waterways; and

Whereas this convention notes with regret that rival meetings have been called in the city of New Orleans on November 29 for the purpose of championing different plans of river improvement now pending in the Federal Congress; now be it

Resolved, That this convention urges the leaders who are promoting these meetings to compose their differences to the end that Louisiana may present a united front to the Congress on the subject of flood control.

[New Orleans Times-Picayune, Sunday, Feb. 20, 1916.]

ADVOCATES SPILLWAYS FOR FLOOD CONTROL OF MISSISSIPPI.

HON. PETER S. LAWTON REVIEWS OPINIONS OF EXPERTS ON QUESTION OF REDUCING FLOOD PLANE OF RIVER, AND CLAIMS BEST ADVICE IS FOR BUILDING "AUTOMATIC CREVASSES."

[By Peter S. Lawton.]

On July 11, 1913, the Mississippi River Commission, at its annual meeting in St. Louis, passed the following resolution introduced by Judge Robert S. Taylor:

"That the district officer in charge of the fourth district be directed to take into consideration the subject of the spillway or wastewear (or more than one if that shall seem desirable) at or near New Orleans and, after making the

necessary surveys and examinations, make a report to the commission covering the following points:

"First. At what stage of the river does a further rise become dangerous to the business and commercial interests of New Orleans?

"Second. Is it practicable to avert that danger by means of spillways or wasteweirs placed in the banks of the river in the vicinity of the city?

"Third. If it is desirable, the construction of such spillways, covering the breadth and depth of the opening in the river bank; the best means to be employed to secure its permanence; the length and slope of the pathway to be provided from the bank opening for the overflow of the water, and the means to be employed to secure its permanence; the length and cross section of levees necessary to control the outflow from the spillway; with the cost of the work in detail, including damages to private property.

"Fourth. Said district officer is directed also, in case he finds such a work to be practicable, to recommend the most desirable location for it; and if he finds more than one to be desirable, the location of each, with all the above-mentioned particulars with regard to each, together with all such other facts and recommendations as shall seem to him to be called for in order to furnish the commission with all the information necessary to enable it to act upon the subject.

"Provided, That the president of the commission be and is authorized in his discretion to direct that the said examinations and report be made by the secretary of the commission, or in part by the secretary and in part by the district officer, as he shall think best."

SURVEYS COMPLETED.

It appears that surveys of the several sites, as covered by the resolution, have recently been completed, and that the report on the same, as well as the commission's recommendation, will more than likely be submitted to the present Congress.

It may be stated also that said surveys were not allotted to the local district officer, but were made, presumably, by the commission's secretary, who is also one of the commission's engineers. The adoption of the spillway resolution by the commission followed the high-water scare of 1913, which flood, it will be remembered, followed upon the heels of the disastrous record flood of the year previous, which latter visitation, according to the State board of engineers' office, cost the people of Louisiana some \$25,000,000.

Spillways or wasteweirs (which are nothing more nor less than regulated crevasses) had not been looked upon favorably by eminent river engineers prior to the great break at Hymelia, when they were confronted for the first time with the startling fact that the old-time crevasse, which had up to this yielded to the levee board's "mud box," had suddenly developed into a Niagara which bid defiance to the resources of Uncle Sam himself.

To the credit of the engineers be it said, however, that they had anticipated just such a condition as the flood of 1912 had precipitated, the gravity of which new condition had been emphasized in 1913, when the commission was roused into the action above mentioned.

Away back in the commission's early history a special committee, consisting of its then president, Col. C. B. Comstock; O. H. Ernst, major of Engineers; Henry Flad, civil engineer; and Henry L. Whiting, of the Coast and Geodetic Survey, having under consideration a report of the local district engineer, Capt. Millis, reported on this spillway proposition in a communication to Brig. Gen. Thomas L. Casey, Chief of Engineers, United States Army, which read as follows:

"Concurring in the inadvisability of an attempt to create new outlets from the Mississippi River which shall be large streams at all stages of the river, we do not wish to be understood as condemning the use in the levees of long wasteweirs to take off the top of the flood, if it shall be found that at certain places in the lower part of the river the further increase in flood flow, which will come from raising the levees at points farther up the river, can be controlled in whole or in part by such wasteweirs more economically than by higher levees."

Judge Taylor, in an address in this city before the convention of the Mississippi River Improvement and Levee Association on October 28, 1903, after condemning the "outlet" as a delusion, said:

"There is a kind of outlet, however, which might be employed on the lower part of the river with advantage, in my opinion. It would be an outlet to take off a carefully-controlled discharge from the very top of an extreme flood, and no more. Its construction would be something like this: We could cut a notch in the bank to a line, say one foot below the surface of an extreme flood such as we had last spring. It should be, I should say, a mile or two miles wide. The bank in front should be securely revetted. The surface of the gap for a thousand feet or more, if necessary, from the margin should be paved with stone. An adequate path for the outflow should be opened at the lowlands, where there would be ample discharge for the water to the sea through bayous or swamps.

"Such an opening would not be an outlet in the ordinary sense of the word. It would take no water from the river except at extreme high stages, and then from the very top of the stream. I should call it a 'spillway' or 'wasteweiir,' rather than an outlet. Three such spillways between Red River and New Orleans would reduce flood heights at this city very materially. They would be followed by the ordinary effect of an outlet on the channel below them in some degree. They might make necessary some additional work at the mouth of the river to preserve the channel depth there. But these results would develop slowly and could be seen coming in time to prevent them by diminution or closure of the spillways. They would be costly not only to construct but to maintain. The water would flow through them only at intervals—sometimes of a number of years. The pathways leading from them would have to be kept clear by constant attention. The activity of nature's forces in this region is such that they would completely choke up such a path with rank growth in a single season of neglect. The construction of such spillways would be practicable at points below Red River. Above that, hardly so; although one can imagine the closure of Old River at two places, and the cutting of a channel down the Tensas, across Old River, between its two dams, into the Atchafalaya Basin as an outlet for spillways above the Red."

JUDGE TAYLOR'S PLAN.

On July 20, 1912, Judge Taylor wrote:

"The recent great flood is just such a case as I previously referred to in which there might be a possible utility in a spillway in the west bank below Red River to take off two or three feet of the extreme top of the flood. Such an outlet as that would undoubtedly have saved the inhabitants below a great deal of strain and disaster. * * * If we knew that the great flood of 1912 had not only made a new record, but had demonstrated a new habit in the behavior of the river so that such floods were to be expected right along, there would be good reason for taking up seriously the subject of providing such outlets as I have described."

Judge Taylor was a member of the river commission for 30 years, and was pronounced by Senator Ransdell, in a speech in the House, on July 19, 1912, in connection with that year's great flood, as our foremost authority on Mississippi River problems.

In an address delivered by Col. Townsend, at Memphis on September 26, 1912, he said, in reference to outlets and wasteweirs:

"Outlets have been suggested as another means of relief, and the Mississippi River Commission has frequently discussed the inadvisability of outlets and wasteweirs as a means of lowering flood heights. I differ with some of my conferees on this subject, but rather in the line of argument than in results. Where the river has depths exceeding 100 feet, as in the vicinity of New Orleans, I am of the opinion we could afford to permit a moderate diminution of river depths if thereby we could obtain a material reduction of levee heights. I also believe that the effect of outlets in reducing flood height is not as great as is popularly supposed. The last flood, however, clearly demonstrated that wherever there was a large crevasse, which is but another name for an outlet, the river ceased to rise."

On June 4, 1913, Col. Townsend wrote, in reply to an inquiry on this spillway subject: "I personally consider the question of sufficient importance to justify a careful survey."

The object of this paper is to suggest to the people of this section the great necessity of organizing, without reference to party or faction, with a view of securing a special appropriation for at least one of these "safety valves," just as soon as the report of said probable cost is made known by the commission.

There is little doubt that the surveys made will show the feasibility of securing the ends of a cut in the main levee of the river such as suggested by Judge Taylor, so that no enlargement of said gap need be feared. Nor can there be any doubt as to the feasibility of constructing the two lateral levees from said main levee back to some sea-level bayou or lake which would safely conduct the water from the river to the gulf. It may also be assumed that viaducts for roadway and railway purposes can be safely erected over such 1 or 2 mile openings, and that such pathways may be made secure against any undue erosion of their sides or bottoms during the short interval the river would call them into requisition.

All this being conceded, would bring the proposition down to a question of dollars and cents, which a strong, united, intelligent, and active organization should have little difficulty in solving, in view of the new record flood which again threatens this lower country with the dangerous and costly uncontrolled and uncontrollable crevasse. The character of the commission's report upon the technical phase of the project will, of course, have great weight with Congress, but it is not likely, in view of the foregoing outline of the attitude of its leading members on this proposition, that the commission will refuse to sanction this experiment, if the survey is favorable as to the physical elements mentioned.

COST OF OUTLETS.

That the cost of three of these outlets will run up into the millions there can be no doubt, but if their installation would put an end to the Hymelia's for all time, by holding the river's flood plane at this city down, to, say 16 or thereabouts, as was figured out by one of the ablest of our river engineers a few years back, could be done by such a system, it would be difficult to compute the other millions they would be worth to this section. It would surely not be too great a mental strain to imagine that if this local river menace was by some magical process removed forever to-morrow morning, the value of every foot of soil between Red River and the jetties would be doubled before to-morrow evening. The flood and the fever were the only two great obstacles that ever did or could prevent the real progress of New Orleans.

One of these shackles has, fortunately, already been removed by the American scientist, at no cost whatever to the inhabitants of these environments. Might it not be but fair to now meet his same scientist half way on the price of our complete liberation, even though this enforced cost would foot up an amount equal to the known toil of one Hymelia?

I repeat, there is little likelihood that the engineers are going to bring in a report saying that a gap in the main levee at a selected locality can not be steel or concrete-faced and be otherwise given sufficient cross section and sub-aqueous protection to make it absolutely safe against erosion. Nor are they going to say that levees across the "pathway," they may finally decide upon can not be built as high and as wide and made as substantial as the pressure of the volume of water to pass between them, may require.

The probabilities are, as suggested, that the estimate of the cost of this work is where all the trouble is going to be encountered, and for this reason I say that this phase should be anticipated and some plan worked out which would induce the Government to take hold of this particular proposition, independent of any Ransdell or Newlands or other bill.

I apprehend, however, that a drastic move of this kind will probably be turned down "flat" from our Washington * * * pressure shall have first been provided for.

In 1913, when the agitation of this same proposition was started here and a mass meeting of citizens without reference to anybody's particular "bill" then pending or proposed in Congress was suggested, rush telegrams came from both factions in Washington immediately to head off this relief measure until some more propitious time, when the matter could be thrashed out by all concerned and its merits from an engineering standpoint be definitely established, etc. Had this extremely important matter been taken up direct with the President (as it should have been) nearly three years ago, it is not impossible that we would have the construction of at least one of these safety valves now well under way.

No one, of course, wants to hamper or "break in" on any Mississippi River levee appropriation because, until this specific relief is provided, we must have the levees—the best and biggest levees that money can put up—to keep this constantly growing river within these mud banks and off the present highly

developed estates which these banks under existing conditions alone can protect.

But while this outlet proposition should not be urged at Washington until such time as the annual allotment for the lower Mississippi has been made, there should be no further time lost after the filing of the commission's report in taking up this extremely important matter of getting rid of a large percentage of this river's flood water now being forced past this city to the sea.

Gauges of 20 and 21 at this city are not necessary for any purpose under the sun, and even if it was certain that this river will not at some time in the future go to 24 or 25, as the experts say it will, now that it is evidencing that "new behavior" mentioned by Judge Taylor, in giving us three great floods in practically four years, against its old-time average of one every five years, it would seem to anyone knowing anything at all about this river menace as being nothing short of criminality to tolerate such a condition a day longer than may be found necessary to provide the means for its dissipation.

Speaking of the steadily increasing height of the river in reference to the commission's 3-foot margin of safety, Col. Townsend, in his Memphis speech, said:

"I do not mean to imply by this statement that the provisional grade adopted by the commission is the ultimate grade to which levees should be constructed; in fact, they must ultimately be built from 2 to 3 feet higher."

On the "ultimate height" phrase, Judge Taylor says in his St. Louis speech:

"Still other circumstances enter to complicate the problem, so that, upon the whole, only the actual confinement of a series of great floods without a break from Cairo to the sea, will give us the ultimate high-water profile."

Why then, in the face of these predictions, have we been adhering to this "higher-levee" policy below Red River, all these years incurring the risks suggested, at such tremendous expense for these giant structures themselves plus the incalculable cost of their attendant Hymelias with their unimaginable factor of demoralization, to say nothing whatever of the injury the high levee has inflicted upon river commerce, nor the stupendous expense this city alone will be faced with, when her entire front will have to be raised and widened to resist the rapacity of this terrible river, after it has given 23 the go by on its aerial journey, under said "higher-levee" system?

THEORIES ADVANCED.

Several theories more or less logical or absurd may be advanced in explanation of this paradox, principal among which, perhaps, is that one which counsels to never "mind about crossing the bridge till you get to it." Another is, that spillways being impossible above Red River where there is no near-by gulf into which to spill, and that this "levees only" system being therefore imperative (during the development of the reservoir at least) at all points from Cairo to the Red, it would not do to discredit this system by any departure from the theory upon which it was founded, even though this was when the lower Mississippi was a comparatively small stream, and when it was fundamental that all of its waters should be "spilled" from the river's mouth.

Still another explanation might be advanced which would place the blame for the palpable delay of this tremendously important river improvement with the Mississippi River Commission itself, in its not having pressed this safety-valve proposition upon its own initiative years ago instead of waiting for a 2,300,000 second-foot discharge in this lower stretch of the river, which volume, according to its own records, is more than twice the river's natural capacity.

Some may indeed blame our waterway Congressmen for not having prodded the commission into advocating this proposition of modernizing some of the many devastating crevasses which have so sorely afflicted southern Louisiana since 1903, when Judge Taylor called attention to the manner in which this might be done, and for which financial arrangements could no doubt have been consummated upon said commission's official recommendation.

But the true reason for this great "fall-down" in the proper handling of the abnormal condition existing in this lower stretch of the Mississippi is more probably chargeable to our own dear selves in not having gone after both Congressmen and commission 13 years ago, when Judge Taylor took the trouble to come to this city to suggest to us that the clock had then struck the hour for the spillway when the river had that year pushed the high-water dial up to

1942, which, he told us, could have been held down very materially "by three of these notches in the levee."

It is barely possible, however, that we were lulled into the apathetic condition mentioned by the specification ordained for the proper solution of this great river problem, which in outlawing everything but "levees only," lent the impression, perhaps, that the fixation and maintenance of the river's channel needed all the water that could be carried between these towering walls. Reference to the essays of the experts on this river problem show most clearly, however, that after the Mississippi rises to a height which submerges its banks or battures and removes these principal supply sources from the action of the strong surface current, the percentage of sediment falls off as the river goes higher, while that of the water rapidly increases; the inference being that since the river was able to take care of itself at, say, a 50 per cent stage with the necessary dredging, it would be entirely safe to divert 25 per cent of the total volume of a record flood. As showing that it is the low river and not the high river that does the scouring, it may be well to quote Col. Townsen (who, no doubt, is one of the greatest of the Mississippi River engineers), who, in his Memphis address, speaking on "The effect of the levees upon the river's bed," said:

"There is considerable confusion in the public mind in reference to the effect of levees on the river bed, some believing that they cause the bed to scour out, while others are equally as positive they cause the river bed to rise. The motion of sediment in a silt-bearing stream is not clearly understood, even by many engineers who write on river hydraulics."

In such a stream there are certain sections called pools, which are usually found in the bends. These are separated by shallower sections, which are called bars. When the river is low the velocity with which the water flows through the pools is less than that with which it flows over the bars, and there is a tendency for the channel over the bars to scour out and the material eroded to be deposited in the pool below. As a river rises the velocity in the pools increases more rapidly than on the bars, and a period soon occurs when there is a greater scour in the pools than on the bars, so that the bars begin to rise and the pools to deepen.

When the river falls the velocities in the pools decrease more rapidly than on the bars and there is a reversal of the process—the bars deepening and the pools filling up. This action is modified by a movement of sand waves down the river and by a centrifugal force which results from the piling up of water in the bends, but it occurs in all alluvial streams which flow with sufficient velocity to scour their beds, whether they are leveed or not. Levees may, to a certain extent, intensify this action, but they will not materially change it.

Notwithstanding that Judge Taylor pointed out in 1903 that it would have then been expedient to put in three of these outlets, each three, four, or five times the width of the river, at selected points within this 200-mile area mentioned, if our people have since that time been deluded by the vociferous demands of the levees only advocates, into believing, nevertheless, that for some reason or other, this high-river system is sacramental in this lower stretch of the delta, it may be safely said that they have been egregiously mistaken.

FOR AUTOMATIC CREVASSE.

After all has been said to the contrary, common sense alone would tell us that if the river has survived the abstraction of its waters by the uncontrolled crevasses of the past, of which there were 38 back in 1897 for instance, it will most assuredly survive the action of a definite number of modernized crevasses scientifically located and constructed, and which, after all, as Judge Taylor says, can be closed up and discontinued, just like the ordinary crevasse, as soon as the river flood subsides, whenever such action, for any reason, becomes necessary. It should therefore seem evident that it is up to the people of this lower section, who alone may enjoy the benefits of the automatic crevasse, to see to it that this improved variety is adopted without further delay, since it goes without saying that the crevasse will be with us as long as the present hodgepodge Mississippi River policy is tolerated.

COMMITTEE ON FLOOD CONTROL,
HOUSE OF REPRESENTATIVES,
Washington, D. C., April 3, 1916.

The committee met at 10.20 o'clock a. m., Hon. Benjamin G. Humphreys (chairman) presiding.

The CHAIRMAN. Now, Mr. Parker, who will be your next witness?

Mr. PARKER. I think Mr. Maxwell has some concluding remarks that he would like to make first.

The CHAIRMAN. We will have to go to the House at 12 o'clock, you understand, to-day.

STATEMENT OF MR. GEORGE H. MAXWELL—Resumed.

Mr. MAXWELL. The discussion that has grown out of the different angles that have been brought up about the flow of the lower river has rather obscured the importance of considering this question of flood control, from a broader point of view, and that is a matter that ought really not to be overlooked.

The statement of Mr. Cooley that the stage of the Mississippi River at Cairo could be increased from 100,000 to 300,000 cubic feet per second at low-water stage, and reduced from 1,800,000 at high water to a stage of about 1,250,000, which is approximately a bank-full stage, as I understand, seems to me to offer to the residents of the lower valley from Cairo down at least as far as Old River, an assurance of positive safety which no possible levee system they could build would create, for the very simple reason that, if the floods as they have accumulated at Cairo up to the present time, constantly enlarging as the years pass, are to continue to enlarge from year to year, it seems almost impossible that any system could be devised of levees exclusively that would ever make the country from Cairo to Old River safe unless other systems of control were adopted.

It is not entirely true that the spillway safeguards could be utilized only for the benefit of the lower country. The plan of double-tracking the Mississippi has been suggested, but that evidently would involve immense expense. I think, however, that if the overflowed areas were examined it would be found that a very great element of safety could be provided by simply utilizing the present tributary flood channels and leveeing them so as to form a system of by-passes or wasteways, so that if the water did get over a certain height and go over the levee in a spillway, even as high up as Cairo, it could be carried to the Gulf without necessarily going back into the river, and the danger of crevasses could in that way be avoided if the river did get above the estimated height at which the spillway had been built.

It seems that the weakness in the plan for the control of the river that has prevailed up to the present time is in effect that while the height of the levee may be established there is no assurance whatever that in some great flood which may just as well come next year as a hundred years from now, that the levee system will be adequate to carry away the water.

The question of source-stream control on the upper tributaries is one that has, in its discussion, been so much misunderstood that I am going to try to lay down a few fundamental conditions and prin-

ciples with reference to it which, I think, will be helpful to this committee, and to a very large extent clear up much of the apparent misunderstanding which has existed in the past. It has again and again and again been stated through the press by opponents of the reservoir system that it would be impossible to store the floods of the Mississippi River that pass Memphis. Nobody contends that it should or can be done; nobody proposes such a thing. The thought never has entered the mind of anybody who has proposed flood control or flood reduction by source-stream control.

It is the last few inches in the height of these floods, as a general proposition, that does the harm. You may take the Ohio River at Cairo as an illustration. You absolutely can not provide flood control and flood safety on the Ohio River by any plan that does not contemplate the control of all the tributaries and of the entire watershed; but there is no one single stream flowing into the Ohio River from either north or south that can not be so completely regulated in all average years that it will practically flow an even volume of water throughout the year, just as the Deschutes River does in Oregon; and if the question were always segregated, and plans for regulating the flow of the river in ordinary years separated in the minds of the people considering the subject from plans for taking care of an extraordinary flood, I believe very little difficulty in handling this problem would be encountered.

A representative of the Weather Bureau at Cairo can predict to a nicety the volume of the flood that will reach Cairo after heavy rains on the watershed at any point thereon. They can predict to an exactitude what is coming to Pittsburgh; and it is the combination of high water that makes the danger, as was stated here the other day when the Pittsburgh hearing was on. A difference of two hours in the time the flood from the Monongahela arrived at Pittsburgh in 1907 would have made a difference of five feet in the height of the flood at Pittsburgh.

If this flood system were put into operation with reference to the entire river, a representative of the Weather Bureau with authority to control the entire system of reservoirs and all flood-control works on the entire watershed could absolutely fix the gage level to which that flood would be permitted to go at Cairo and could prevent it from going one single foot above that point.

Now, what is to be done to bring that about? In the first place, the utilization of the water in the average year which now runs to waste in floods, for industrial and other beneficial uses, will regulate the flood to that extent, so that it will flow evenly through the year. The development of water-power resources of the whole mountain country, if completely carried out, will very largely solve the question of the regulation of the flow of the river in all ordinary years, because every water-power plant desires, to the utmost possible extent, to regulate the flow of the river evenly through the year during the ordinary years, but when the extraordinary floods come, like the flood of 1907 or the flood of 1913 in the Ohio Valley, the surplus water is of no value whatever to them, and the power reservoirs will all run over. They were never built for the purpose of holding such an extraordinary flood, and they would not help you one iota in the year of extraordinary high water; in other

words, you have got to first take care of the floods of ordinary years; and then, after you have provided for that, you must, as a separate proposition, take care of the extraordinary floods.

It has been established beyond all question by experiments and demonstrations that have actually been made, that the water that falls on the State of Ohio in an ordinary year can, every drop of it, be utilized beneficially for agricultural and industrial uses, and soaked into the ground itself, first, as a natural reservoir, before it, by saturation and seepage, comes back into the streams.

Col. Freeman H. Thorpe, who was for many years a well-known resident of Ohio, and who for the last 15 years has lived in Minnesota, has made that demonstration, and his work has been referred to in a Senate document on that subject, which I would like to have the privilege of having included in the record of these hearings. It is a very short document, only three or four pages.

The committee has not the time available to make it possible at this time to go into the details of just how all of this water can be used, but that it can be used is something that no one who understands the subject for a moment questions, in all ordinary years. If you reduce the flood level of the ordinary years to an average level throughout the year, raising the low-water stage and lowering the high-water stage, to the extent that you have reduced the high-water stage, you have created that much additional channel space for the carrying away of the unexpected flood of the extraordinary year. Without other expense, you have to a very large extent created a margin of safety consisting of a larger available channel capacity which would not have existed in your Ohio flood of the extraordinary year if it had come on top of the flood which was running at the height at which the streams in the high-water season run to-day in Indiana and Ohio in the ordinary years.

When you come to take care of the extraordinary flood, it must be done by surplus emergency-impounding basins or detention basins or impeding reservoirs used only for the purpose of holding back the flood water just so long as it is necessary to hold it before it can be turned into the channel and find in the channel the space necessary to carry it.

If you go into the valleys of the Allegheny and the Appalachian Mountains that drain into the Ohio River, you will find valley after valley, and valley after valley, where it would be inadvisable to sacrifice the possibilities of power development only for flood control; but if the system is adopted, as it can be if we have proper national legislation, that the power reservoirs would be built up to the point where in all ordinary years the stored water could be used to develop power, and above that a storage capacity created, which would be used only for flood control, you would have the valleys below entirely protected from floods. The flood water which had been stored for flood control only could be held back until the river could carry it, and then turned into the channel.

This weather bureau representative at Cairo, having control of all these flood-impounding basins, as they are now building them for the protection of Dayton and for Columbus, as they are proposing to build them, and as they ought to be built on every tributary, could know to a nicety just when the water from these reservoirs could be

emptied into the main river and find channel space to carry it without going a foot above the prescribed safety level at Cairo.

Mr. CLINE. You take the level country of western Ohio and eastern Indiana, where in 1913 in three days 8 inches of water fell. Do you not regard it as pretty nearly an impossibility to impound those waters, because it is only in the extraordinary rainfall we have them, so as to prevent serious damage by floods? In other words, is not the danger reduced to the minimum by providing such channels as will keep the water constantly on the move, instead of attempting to impound vast volumes of water in that country?

Mr. MAXWELL. No. I am very glad that you asked that question, because it brings up the point that has really been found to be the solution of the flood problem in that country. Before the Dayton flood it was stated as his opinion by Gen. Bixby that the only way to control the flood was to open the channels and shoot the water into the river just as soon as possible. That was Gen. Bixby's belief as Chief of Engineers of the United States Army. He ridiculed the idea of controlling that flood with reservoirs as an impossibility. Since the Dayton flood they have found that by using these impounding or detention basins or impeding reservoirs they can hold that water back until the channel will carry it, and in that way avoid entirely the danger of the water getting over the channel banks. That is an entirely different proposition from the question of taking care of flood water in the ordinary years.

This year in which you say there was 8 inches of water fell was the great Ohio Valley flood of 1913. That flood could not have been taken care of on the Miami River without these impounding basins, but the basins are there, and the Dayton people have made a plan for utilizing them, and the plan absolutely protects the Miami River from floods, because it makes it impossible that the channel shall ever be expected to carry more water than the cross section of the channel makes possible. Have I covered that point?

Mr. CLINE. I understand your position.

Mr. MAXWELL. It is not only my position, Mr. Cline, but it is the position which has resulted from the actual investigation made by the engineers for the local Dayton Flood Commission, which has been examined and confirmed by a board of the most eminent engineers of the United States.

Mr. HUSTED. May I ask you a question?

Mr. MAXWELL. Certainly.

Mr. HUSTED. This colored space shown on the three maps on the wall representing the areas of precipitation during the floods of 1913 and of this flood of 1916 were laid out by the Government Weather Bureau?

Mr. MAXWELL. I believe so.

Mr. HUSTED. Now, the testimony before this committee is to the effect that in those areas there is no available reservoir site which could be built at a practicable cost which is capable of impounding enough water to have materially affected either of those floods.

Mr. MAXWELL. That, I understand, is all one flood.

Mr. HUSTED. That is all one flood, but it represents the precipitation at different periods which affected the flood.

Mr. MAXWELL. That is undoubtedly true. We do not question that at all. We do not claim otherwise, but here is the point, and it is this question we have been finding so much difficulty in getting the people generally to understand.

Here is an excessive rainfall in this section [referring to maps]. That water from Arkansas all works its way right down into the Mississippi River. It is an open question whether levees ever can be built which will carry such a rainfall as that to the Gulf if the river were already high from upstream sources when this lower heavy rainfall takes place. This excessive rain in this section in Arkansas and Missouri can be taken care of in the river below if it is not increased by water coming down from above, but if that rainfall had taken place in 1913 and then the storm had gone right on over to the Ohio Valley and dropped its heaviest water farther up in this yellow space; if, instead of stopping where it did in 1916, it had gone right on across Indiana and Ohio, you would have had a flood in the Ohio coming down the Mississippi which would have made it impossible for any levee system to have carried that water to the Gulf.

What I am trying to explain is the guaranty that may be afforded by source-stream control that there will never be at Cairo, coming into the Mississippi River from those upstream sources in the Ohio Valley, so high a flood that any water that may fall below Cairo can not find its way to the Gulf without overflowing the levees. The Ohio River is the greatest contributor to the floods of the Mississippi River. If the Ohio is controlled, the river can take care of floods from all other tributaries without danger of flood devastation in the lower valley. No two floods are alike. The flood of 1912, which was the most serious proposition that they ever had in the lower river, for the reason that it remained so long, came from a general heavy snowfall and rainfall over practically all the entire upper watershed and the Missouri and the Mississippi and the Ohio were all high at the same time, but none of them at excessive flood stage.

If, in 1913, the great amount of water which was coming out of the Missouri and the upper Mississippi on the exact day in 1912 on which the Dayton flood came out in 1913, had been coming out in 1913, and the Dayton flood in 1913 had struck that high water from the Missouri and the upper Mississippi, no levee system below would have held it.

The point that we make is, and whenever the whole thing is understood there is no question about the fact—I am taking a good deal of time to explain it, but there is no question about the fact—that the flood of 1913 could have been absolutely controlled at Cairo. There was no flood out of the Tennessee, or the Cumberland, or the Kentucky, or the Big Sandy, or the Kanawha, or the Little Kanawha, or the Monongahela, or the Allegheny in 1913. The flood of 1913, practically all of it, came from Indiana and Ohio and slopped over a little on the headwaters of the Beaver, in Pennsylvania, overtaxing one stream after another. The Ohio people have positively proved that they can hold back that water until the channel will carry it on the Miami. That will protect Dayton and Hamilton.

I have here, and I will ask to have it inserted in the record at the close of my remarks, a very brief résumé of a 400-page report by Alvord and Burdick, with reference to the watershed above Colum-

bus, in which they report that by building these detention basins—they, of course, being supplemented by levees—they could take care of a flood 45 per cent in excess of the 1913 flood. Think of that—45 per cent in excess of the 1913 flood at Columbus. One of their detention basins includes 9,580 acres.

The CHAIRMAN. Columbus, Ohio?

Mr. MAXWELL. Yes, sir; this is the Columbus, Ohio, report, just published. Of course, I have been watching those things very closely, and I do beg of this committee not to assume in advance of such engineering reports as this that these tremendous floods like the 1913 flood in Ohio can not be controlled, because they can, provided the flood-control works are built on all the tributaries of the Ohio River.

Mr. CLINE. What is the extent of the detention basins?

Mr. MAXWELL. One basin only is 9,580 acres in extent. I do not believe, Mr. Cline, that you were here when I was explaining that the other day, when the Pittsburgh people were here. I would like to say just a word on that question, in order that you may understand it. These detention basins have been in use in Europe for many years. They hold back the water in a valley just long enough so that the water will flow from the mouth of the valley into the river below, only discharging so much water as the channel will carry without overflowing.

Now at Dayton, the whole damage that was done at Dayton and Hamilton was due to the fact that they forced through that channel in about three days water which should have had nine days to go. If they could only have held it back six days, they would have avoided every dollar of damage from Dayton down.

The CHAIRMAN. Do you agree with the statement of the engineer who was here the other day from Pittsburgh—I do not recall his name—

Mr. MAXWELL. Mr. Knowles.

The CHAIRMAN. Yes. That the influence of reservoirs above Pittsburgh which would control the flood at Pittsburgh would be dissipated before it reached Cairo.

Mr. MAXWELL. I do not think it would be appreciable, but that is the very thing that I am trying to make clear this morning, and I do want to make that clear. You can go to the mouth of the Cumberland or the Tennessee, and go up those rivers and absolutely control their flood. They are easy to control, and the control of their floods need not interfere at all with the development of power. You go up on the other side of the Ohio and take the Wabash, and you can control the Wabash as you can control the Miami. You can control the Miami, you can control the Scioto. You can control the Muskingum; you can control Beaver Creek, and when you have got to Beaver Creek there is no large stream between there and the Allegheny. You can control the Allegheny. You can control the Monongahela and all its tributaries. You can control Wheeling Creek. You can control the Little Kanawha and the Big Kanawha, and you can control the Big Sandy and the Kentucky; in other words, taking each stream by itself you can absolutely control it, as has been proved by the best engineers in the world you can control the Miami and the Scioto. That being so, what is the result?

If there is no combined control of all those tributaries of the Ohio, you may create conditions as bad or worse than before you had these individual streams controlled. But if you have a man representing the Weather Bureau of the United States in charge at Cairo, with the absolute power and authority to say when the gate of any one of these reservoirs shall be opened, and he is watching his gauge level at Cairo, and there comes a flood like there was in 1913 in the Ohio, and it swings around a little further, and there is more water coming in from the lower rivers, he simply tells those people on the Miami "Hold your water back in the detention basins. You may have to hold that water there a week, two weeks if necessary, until the channel space at Cairo will carry it, and I will let you know when to open those reservoirs," and he does the same thing on the Scioto and on the Muskingum and on the Allegheny. He can fix a gauge level at Cairo to which he can hold the water down, and when the water has gone down a few feet and he has got some channel space, he telephones to Dayton, or wherever the reservoir he desires opened is located, to let so much water out, and he does the same thing on the Muskingum, and he lets it all out just as fast as he can, but he does not let it out until the Cairo Channel will carry it without getting above a perfectly safe stage, 34 feet, for instance, at Cairo.

That is a matter, Mr. Chairman, that absolutely does not admit of dispute.

The CHAIRMAN. Let me ask you a question. I want some further information on that. I understood from you, as I have understood from others, that above Columbus and above Dayton the idea was not to have a reservoir, but to have a restraining dam there, that would permit just enough water to go through the gap in the dam not to overflow the channel below.

Mr. MAXWELL. That is it exactly.

The CHAIRMAN. Now, under your theory they would have to have some controlling works by which they could shut it off for as long as two weeks?

Mr. MAXWELL. No; I did not make myself clear. Let us take the flood of 1913 as an illustration, because that was perhaps the most serious flood that ever came out of the Ohio River to the lower valley; because that year the Ohio practically did all of the damage. That is the best way to get at these things, by just taking a flood and illustrating what you would do at every stage of it. Suppose that the whole system of control works on the Miami had been finished, and that they had had a similar system on the Wabash, and that they had had a similar system on the Scioto, and a similar system on the Muskingum, and a similar system on Beaver Creek. Those are the streams that the flood of 1913 came out of. There was no trouble that year with any of the other tributaries. Then the Weather Bureau man at Cairo; he sits there watching the gauge, and says, "Here, we have got a stage of 34 feet at Cairo. We have got to let this river clear a little before we let any more water into it. I can have this water held back in these impeding reservoirs," as Mr. Cooley call them, or detention basins. "It will not do to let that water out of those basins as fast as it can be let down into the channel, because it will do damage below. We will hold that water back until the main river clears."

The CHAIRMAN. For two weeks?

Mr. MAXWELL. The necessary time, whatever it may be.

The CHAIRMAN. So that, in addition to this gap in the dam that is to regulate the discharge, so as not to overflow the channel below, you would have some way by which this could be shut off and held in this reservoir?

Mr. MAXWELL. If necessary; yes, sir.

The CHAIRMAN. Have you any estimate of the size of that kind of a reservoir? They have an estimate of what would be necessary to let the water run over all of the time and fill the channel below flood; but to shut off that for a week, or, as you suggested, for two weeks, of course, would require tremendously increased area in storage capacity.

Mr. MAXWELL. No; it would not necessarily, because if the streams which I have mentioned—in Ohio in 1913—had been only feeding into the Ohio River the volume of water which those streams would have carried without local overflow, the Ohio would have carried the flood without any damage. It is taking off the surplus flood water which will cause the local overflow, and holding it back that relieves the pressure on the main river.

The CHAIRMAN. Then there would be no occasion for this man at Cairo to say anything. You are confining the flood to the channels in these rivers up in Ohio, and that does not cause the overflow in the Ohio, so that there would be no occasion to telegraph the man to do something else.

Mr. MAXWELL. That would have been true. Mr. Chairman, in 1913, as the flood came from the Ohio River tributaries in Ohio and Indiana. But here is the point: If this flood instead of spending itself, as it did, on the crest of the watersheds in Ohio and then sliding off over the lakes had swung a little farther to the east and caused a downpour on the headwaters of the Allegheny and the Monongahela, such as it caused on the crest of the watershed in Ohio, you would have had a flood in the Ohio Valley that would have strained every source to control—but it could have been controlled. It would have been necessary, however, in a case of that kind, instead of emptying these impounding basins as quickly as the local channels would carry them, to have held as much water as possible back in the basins until the main river had cleared sufficiently to permit of the reservoirs or basins being emptied into the river without causing the flood level in the main river to rise above the danger point.

The CHAIRMAN. There was a question that I wanted to ask. There are two questions, rather, that I want to ask. The first is, in the event of this last contingency you mentioned, it would have been necessary to have had controlling works to have held back those floods and not permitted it to go out over these retaining dams?

Mr. MAXWELL. Yes; it would.

The CHAIRMAN. Then it would require a very much larger area for the reservoir above the gap?

Mr. MAXWELL. No; the only difference, Mr. Chairman, would have been this: They would have run the water back to the contour line to which they had estimated they could fill that basin or reservoir. There was no thought in the mind of anybody who planned these reservoirs or basins, except taking care of the Miami River—

The CHAIRMAN (interposing). We have this other point.

Mr. MAXWELL. They are not taking any thought of anything except to get that water down the Miami into the Ohio, without doing any damage on the Miami, and they felt if they could do that that they had succeeded in getting that water off of their hands—

The CHAIRMAN. I do not seem to make myself clear to you. I was going upon the theory that this matter was going to be regulated by the man at Cairo who looks not only to what the people of the Miami Valley had in their minds.

Mr. MAXWELL. That is as it should be.

The CHAIRMAN. Yes; if the flood is to be retained for two weeks behind that restraining dam, is it not your thought that the area of the reservoir above that dam must be very largely increased?

Mr. MAXWELL. No.

The CHAIRMAN. You think that the same area would hold it for two weeks as would hold it if it were permitted to run the channel banks full quite a little while?

Mr. MAXWELL. Yes, sir. Here is a great flood coming down the river above Dayton, passing through this valley. They have got to hold back, say, two-thirds of the flow above Dayton—of course, that is a rough guess—in order to protect Dayton and carry the water through the channel at Dayton. They fill that water up to the highest level that they can in their detention basin—to the spillway level—and close the gates.

The CHAIRMAN. There will be a gate there?

Mr. MAXWELL. Oh, I understand it that way; yes, sir; just as the Nile is controlled by gates at Assuan, where the water always runs out under the gates.

I really think that it would be very desirable indeed that the complete system which they propose to carry out at Dayton should be understood by this committee. If there is nothing to be considered but the Miami River, the minute the channel in the Miami River will carry that flood, it may be turned into the river and no harm done in the meantime on the Miami, but in order to make sure that you are going to have a certain fixed standardized stage at Cairo, you have got to know when this flood water from the various tributaries is to be turned into the Ohio River, and you have got to have all of these tributary streams controlled.

The point that I make about Pittsburgh is this: The fact that the Pittsburgh reservoirs by themselves do not control the floods of the Ohio River is no more reason for arguing that they should not be built than there is reason to claim that you should not make a wheel because you can not make a wheel from one spoke.

The CHAIRMAN. Let me ask another question. As I catch it, your understanding is that it would require no more reservoir with the gates closed than with them open and regulated. Assuming that this flood had gone where you suggest, in 1913, if it be true, as Mr. Knowles stated—

Mr. MAXWELL (interposing). Mr. Morris Knowles.

The CHAIRMAN (continuing). That by the control of the waters above Pittsburgh by the proposed reservoirs the influence of these reservoirs would have been entirely dissipated before that flood reached Cairo, what difference would it have made in this flood

whether they had had the reservoirs there or not, if the influence had entirely disappeared before reaching Cairo?

MR. MAXWELL. If you take any one of the tributaries of the Ohio—I will name the tributaries—the Wabash, the Miami, the Scioto, the Muskingum, Beaver Creek, the Allegheny, the Monongahela, Wheeling Creek, the Little Kanawha, the Big Kanawha, the Kentucky, the Big Sandy, the Cumberland, and the Tennessee. Now, I have named 14, I think. I imagine that if any one of those tributaries were as completely controlled as the Deschutes River, in Oregon, is controlled, it would not make an appreciable effect upon the stage of a flood at Cairo—it would be absorbed in the larger mass; but if you go deliberately to work, as you can, to control all of these tributaries, and if the man at Cairo in charge could direct the volume of the water coming out of each tributary, you have absolutely controlled the floods of the Ohio above Cairo and also at Cincinnati.

THE CHAIRMAN. I do not suppose anybody would question that.

MR. MAXWELL. That being admitted, Mr. Chairman, it then merely becomes a question of what it is worth to remove the danger of a repetition of such an appalling catastrophe as this flood of 1913 or a still more appalling catastrophe such as might have taken place if that storm had drifted a little farther to the east.

THE CHAIRMAN. I am wondering if Mr. Knowles was right in his statement that the control of the flood waters above Pittsburgh would not contribute to this general control, if all the others which emptied very much near Cairo were controlled—if that was true?

MR. MAXWELL. I entirely agree with his statement in that respect.

THE CHAIRMAN. That would not make any difference. If you control the rest of them, it would control the flow at Cairo. That is bound to be true if the reservoirs above Pittsburgh do not influence the river that far down. Of course, so far as the floods there are concerned, it would be immaterial whether they were controlled or not. But there is another question. Have you made any estimate or has anybody that know of made any estimate, as to the cost of controlling all these tributaries to the Ohio River?

MR. MAXWELL. I do not think that has been done, and that is a thing that ought to be done, and it is one of the things that we hope to get done without delay when we get this broader legislation.

THE CHAIRMAN. Mr. Leighton, of the Geological Survey, did make an estimate. Do you recall what his estimate was?

MR. MAXWELL. No; I did not. I did not pay very much attention to it.

THE CHAIRMAN. He said that it could be done for \$500,000,000 or \$1,000,000,000.

MR. MAXWELL. I think that estimate was misleading. I feel that I am taking too much time, but I think—

MR. HUSTED (interposing). I would like to ask you a question.

MR. MAXWELL. Very well, sir.

MR. HUSTED. I did not understand your plan quite as well as I would like to, but as I understand it, your plan is to hold back on all of the tributaries of the Mississippi in reservoirs the normal floods of the tributaries.

MR. MAXWELL. On the Ohio; yes, sir.

Mr. HUSTED. In anticipation of a flood. Your idea is, as I understand it, to take from the Mississippi River the normal flow.

Mr. MAXWELL. Let us confine it to the Ohio.

Mr. HUSTED. In order that, when a flood comes, you will have only so much in the river.

Mr. MAXWELL. That is true of the Ohio. I am trying to talk of the Ohio by itself. Let us confine it to the Ohio.

Mr. HUSTED. You do not propose to hold back any flood water? You propose to hold back the normal water.

Mr. MAXWELL. No; perhaps I did not get that quite clear. In all average years the channel space in the river in the high-water season—the carrying capacity of the channel of the river in case of a flood—can be very much increased if you conserve or store the normal flood water so that you will be—

Mr. HUSTED (interposing). Pardon me; what do you mean by the normal flood water?

Mr. MAXWELL. The normal flood water that comes year after year, when there is no damaging flood; for instance, the Miami ran for 30 years without any flood of the character of the flood of 1913.

Mr. HUSTED. What I can not get clear is this; and I would like to have it made clear if possible: The water experts inform us that all of the rains that created these floods in 1913 and 1916 fell within the areas shown on these maps [indicating].

Mr. MAXWELL. Yes, sir

Mr. HUSTED. Now, the engineers of the Mississippi River Commission tell us that these rains fell in territories in which there were no available reservoir sites to impound a sufficient amount of water to materially affect the floods.

Mr. MAXWELL. I think I can explain that to you.

Mr. HUSTED. Is it true that those waters did not fall at the headwaters of the tributaries where reservoirs could be built?

Mr. MAXWELL. That is true.

Mr. HUSTED. They fell outside of that area. Now, if that is the case, how would the building of detaining basins or reservoirs on the headwaters of these tributaries affect these floods unless you hold back the normal flow of these tributaries in order to give more space in the Mississippi River for the flood waters?

Mr. MAXWELL. Do not let us mix the Ohio with the Mississippi River. Let us take the Ohio. I can make that perfectly clear to you. That confusion of thought with reference to this whole question arose from a confusion of terms. The Chief of the Army Engineers in the statement to which I have referred spoke of "reservoirs." Let us speak of a reservoir as something to hold the water back indefinitely. Take a power reservoir. You build one on the Kanawha and your purpose is to hold back the water for a considerable period, until it is needed. You will fill that reservoir as full as it will get and keep it full as long as you can, in all ordinary years, and the result will be to equalize the flow of the stream through the entire year. You will endeavor by every means that you can devise to keep that reservoir full all the time. Now, that is a reservoir.

There are no reservoirs of that character in Ohio and in Indiana, from whence this flood came in 1913, large enough to hold back that flood. That is true; but that is true only of what we have just been

calling a reservoir—a storage reservoir built for the purpose of holding the water back indefinitely. Different terms are used to express what is meant by these impeding reservoirs. Mr. Cooley, as I understand, calls them “impeding reservoirs.” I have been calling them “emergency impounding basins,” and I see in the Columbus report that they call them “detention basins.” The idea of these detention basins, for instance—one of them referred to here in the Columbus report contains 9,580 acres. It will hold at the spillway level 255,925 acre-feet of water, and flood 9,580 acres.

The project also requires a large detaining basin on the Olentangy River, about 2 miles above Delaware. This will be formed by an earthen dam 82 feet in greatest height, and 850 feet thick at the base. It will hold at spillway level 163,202 acre-feet, and will flood 11,299 acres of land.

Now, the Dayton-Hamilton plan on the Miami River is similar to this plan with these detention basins. They are not reservoirs in the sense that most everybody understands is meant by a reservoir.

The CHAIRMAN. How many acres would that overflow if the gates were closed for two weeks?

Mr. MAXWELL. One of them would overflow 9,580 acres.

The CHAIRMAN. Then, would this basin discharge just as much water as the channel below can take and no more? Suppose that is closed two weeks?

Mr. MAXWELL. That was the area overflowed at spillway level. That is, with the basin filled to the height of the dam and the water running over the spillway. That means that the detention basin is full, as high as it can be filled. It will not hold any more. It has risen until the water is running over the dam or over the spillway. That is “spillway level.” Now, I assume that their plan provides a way of opening those dams and letting that water out, otherwise it would have to evaporate or soak into the ground before the land that had been overflowed could be again used for some other use. The plan contemplates drawing the water out of the detention basin as soon as the channel will carry it.

The CHAIRMAN. Let us see if I catch the point about that. That spillway—does that mean the entire crest of the dam?

Mr. MAXWELL. I would not say that. They may have a spillway which does not extend clear across the crest of the dam, like the spillways at the Roosevelt Dam.

The CHAIRMAN. Is it not your understanding that they have a spillway there out of which enough water may escape to fill the channel of the river and no more?

Mr. MAXWELL. That may possibly be true; I think that is quite likely. But bear in mind, Mr. Chairman, that if that structure is built that way it would be a matter of comparatively, I would not say of small expense, but not at all an impossible expense, to build a gate which would let that water out whenever they wanted to let it out. It seems to me certain that they have such gates, because they do not intend to keep that water in that detaining basin any longer than is necessary to clear the channel below, and the moment they can lower the water in that basin without overcharging the channel below they will open their gates and take all of the water out of this detaining basin and run it on down into the Ohio River.

The CHAIRMAN. Is it your understanding that this detention basin is large enough to hold a two weeks' flood and still only cover 9,000 acres?

Mr. MAXWELL. I should judge probably not that one basin, because, you see, they have another basin on the Olentangy.

The CHAIRMAN. But the other one is at another place.

Mr. MAXWELL. It is a question of the volume of water that falls and must be held back.

The CHAIRMAN. When it gets full it runs over the spillway?

Mr. MAXWELL. When the basin gets full it runs over the spillway.

The CHAIRMAN. And only so much can run over the spillway that the river below can take?

Mr. MAXWELL. All I know about it is what this article states. It is a very brief article, and I have never seen the construction plans.

The CHAIRMAN. I was just wondering what the extent of the area of that reservoir would be or would have to be if it became necessary to impound those waters for a week or 10 days, by the man at Cairo, for instance. I was just wondering how much area it would require for that reservoir for that purpose.

Mr. MAXWELL. Exactly what they have provided, with this point in mind, that their plan is to empty that detaining basin as soon as possible.

The CHAIRMAN. But they would not have any authority over that. The man at Cairo will determine that.

Mr. MAXWELL. If the man at Cairo has the authority, he will simply detain that flood water in the basin—

The CHAIRMAN. Will it hold it? That is the question in my mind.

Mr. MAXWELL. Oh, entirely. I see what is in your mind. I, perhaps, have not grasped it before. In Europe they have built for centuries impeding reservoirs by merely narrowing the mouth of a valley, so that only sufficient water would run through to fill the channel below, and it would continue to run out at that volume until the detention basin was clear. I do not understand that these detaining basins in Ohio are contemplated to be built on that plan, because they speak of a spillway. In Europe there is no spillway. There is only a narrowing of the cross section, and that cross section is narrowed until it is no larger than the channel below.

Mr. CLINE. They are built on the same principle they used to build the old water-wheel sawmill—just build a dam across the stream and hold the water back and let it out through a flume.

Mr. MAXWELL. They are built that way; but they must have, in addition, gates at the bottom to let the water out entirely from the basin when they do not want it in there any longer.

Mr. CLINE. They have what they call an extra flume. Whether you can make a practical application of that—you probably know something about the general topography of the country around the Wabash. The Wabash rises in the northern part of Indiana and flows southwesterly 150 miles through a low, level country. It has not much fall, but flows through one of the richest valleys in the world. Do you know enough about the Wabash to say where you would put your detention reservoirs, and is it not true that you would flood enough of that rich, fertile valley as to make it perhaps more economical to let the water go on through?

Mr. MAXWELL. I want to answer two questions there. In the first place, if the Miami and the Scioto and the other tributaries of the Ohio River above, which we know can be controlled, were all controlled, the Ohio could always carry what comes out of the Wabash. In the second place, so far as the Wabash is concerned, the strange feature about this whole proposition is that until surveys were actually made, it was persistently and earnestly contended that there were no reservoirs which could be used for this system of control. It was contended for years that there were no reservoir sites that could be utilized above Pittsburgh, and the Pittsburgh Flood Commission had to spend \$150,000 to survey the country, and they published their report showing exactly where the reservoir sites are located.

Mr. CLINE. What we are trying to accomplish in the valley of the Wabash, in that very thickly settled country, is not to flood that country but to save them from the floods.

Mr. MAXWELL. The only thing that it is necessary to do, to be sure that the very best thing that engineering genius can devise will be done for the Wabash, and do it in a way that will make the Wabash Valley free from floods, is to go and have the Wabash surveyed and lay out your plan and harmonize it with the plans for the control of these other rivers.

The CHAIRMAN. And follow the suggestion of the engineers?

Mr. MAXWELL. My observation has been that invariably the opinion of the engineers has been finally favorable to reservoirs when that opinion has been based upon facts.

The CHAIRMAN. After this thorough investigation has been made, as completely as engineering skill can make it, you think that we should then adopt their plan?

Mr. MAXWELL. You should not adopt any plan with reference to the Ohio River upon the theory that you are going to control the flood of the Ohio at Cairo, which is the only way and place to control it, until you have all of these streams surveyed and have a plan made which will adopt a system the best adapted to the Ohio River and to each tributary river, which when brought together under one complete plan absolutely controls the Ohio River. It may be that the best way to control the Wabash would be to widen the channel and let the water run out as quickly as possibly, and if all of these other tributary streams were controlled, that could be done without creating a flood in the main Ohio River. The Wabash never took enough water into the Ohio to make a flood at Cairo. If you can hold back the flood on the Miami and on the Scioto and on the Muskingum and on all of these mountain streams, like the Allegheny and Monogahela, that run back into the mountains, you can take care of the Wabash without any trouble whatever.

Mr. RUSSELL. Is it not the Tennessee or the Cumberland that have the chief influence on the Ohio at Cairo?

Mr. MAXWELL. The Tennessee and the Cumberland both drain a very large territory, but they are easy to control, running through mountains and valleys.

Mr. RUSSELL. If the Cumberland and the Tennessee could be controlled by the reservoirs or dams, would not that very quickly reduce the flood waters at Cairo? I mean, those two rivers alone?

MR. MAXWELL. That brings up the very point I have been wanting to bring out. I should answer that question yes, but it brings up again that question that no two floods are alike. If a big flood were coming out of the Cumberland and the Tennessee, with practically no floods on the north, then the control of the Cumberland and the Tennessee would prevent the flood; but if, on the other hand, the flood was coming from the north side of the Ohio, as it did in 1913, then the Cumberland and the Tennessee would not cut any particular figure, but—and this shows the importance of having all of this under one control—if high water had been coming down the Ohio from above, and at the same time the Cumberland and the Tennessee had been high, if you could not have held the water back in the Cumberland and the Tennessee, you could not have prevented a flood. When you are prepared to hold it back on all of the tributaries, you can let it in from such sources as will never overcharge the channel at Cairo.

MR. RUSSELL. That question was suggested in my mind because I live in Missouri 12 miles from Cairo, and for 50 years I have heard the pioneers in that country, the people who have been there for a long time, every time there is a freshet, inquire what the Cumberland and the Tennessee were doing. That was their fear.

MR. MAXWELL. So far as I know the only flood in the Ohio River which came practically all from Ohio and Indiana and was enough of a flood to make such breaks in the levees as were made that year in the extreme lower Mississippi Valley, was the flood of 1913. But it is not safe for us to assume that the biggest one you have had is the biggest one you are ever going to have.

MR. RUSSELL. They may all come at once?

MR. MAXWELL. They may all come at once, and that is exactly what happened in the big Paris flood a few years ago. For 260 years they had not had a flood coming from the two big tributaries of the Seine at the same time, but in that year they did, and then they found out that 260 years ago they had a flood that went 6 inches higher than the flood of a few years ago—five or six years ago.

That is as much as I think I ought to ask time to say, Mr. Chairman, on the subject of the Ohio River.

When you pass to the Mississippi River and consider the question of storage for electrical power purposes and the building of flood-control reservoirs like those that are built at the headwaters of the Mississippi, the practicability of flood control of the Mississippi is established by records and surveys and figures which are in the reports of the Army engineers. You do not have to go outside of those reports for them. When you come to the Missouri, you can go out into Kansas and Nebraska and into the arid regions of the West and the whole country is a great natural sponge, absorbing the water, and what you need is to get the flood out in great wide flood canals, so that it can be spread over the country and soaked into the ground and impounded in basins on the prairies. You can take out a great-flood water canal at Great Falls, and others below at proper intervals, and the whole flood of the Missouri River above Omaha can be absolutely taken care of and controlled.

I want to just bring this one thought to your minds as to this question of the absorption of the flood water into the earth sponge. The

Ohio, River, for instance, drains a basin of 205,000 square miles. The distance from Pittsburgh to Cairo is something less than a thousand miles. If 12 inches of run-off—that is about the average run-off—should simultaneously run off from the entire Ohio River drainage basin and pile up in the Ohio River it would make a body of water a thousand miles long, a mile wide, and 200 feet deep. Just think of it! That is only 12 inches of run-off. In the Ohio River basin a great deal of the run-off can be absorbed into the earth by proper methods. In the arid regions all of it could be absolutely cut off, so there you have a different proposition entirely. The floods of the Missouri could be controlled so that the river would flow just as regularly at Omaha as you would run water out of a pipe. There is not any question of it. When you come to the floods lower down to the Missouri you have a more difficult problem, but they can be controlled.

I would like to offer for the consideration of the committee this map, which has been prepared by the Forest Service. It indicates the general idea of controlling the water on the upper watersheds rather than letting it come down and flood the lower valleys; and also this article in the Engineering Record of March 25, 1916, on page 419, descriptive of the plan for the protection of Columbus from the floods.

Mr. HUSTED. What I can not understand is that, if the rains which caused these destructive floods do not, as the engineers tell us, fall within the area of the higher tributaries, how you are going to control any floods on the higher tributaries.

Mr. MAXWELL. I am going to ask you to let me say a few more words on that subject; and I am going to ask your sympathies with us, because we have had for 20 years to try to explain to the people of the United States why the engineers were wrong. You take this flood of 1913. It fell in Ohio and Indiana, as this map shows. It did not fall on the Allegheny or Monongahela, or the Cumberland or the Tennessee. They had practically nothing to do with it. The Wabash, the Miami, the Scioto, the Muskingum, and Beaver Creek made that flood. At the time that flood came engineers gave out interviews for publication all over the United States as to the absurdity of proposing to control that flood with reservoirs. They said it was perfectly ridiculous; they could not find words sufficient to express their contempt for the opinion of people who thought it was possible to control such a flood as that with reservoirs. But let us never lose sight of the distinction between reservoirs and these detention basins.

Mr. HUSTED. What difference does it make what you call them, whether you call them reservoirs or detention basins? You have got to have a place where enough water can be held to materially influence the flood, haven't you?

Mr. MAXWELL. Well, I draw the distinction, Mr. Husted, in order to give the engineers an opportunity to retire from a wrong position and save their faces, because if you include detention basins as reservoirs, and emergency impounding basins as reservoirs, then the statement of the engineers might be justified by claiming that when they said reservoirs they did not refer to detention basins or impounding basins.

The worst flood of 1913 was on the Miami River, and if you could have gone through Dayton and Hamilton and down that flooded area, as I did a few days after that flood, and seen the ruin and devastation that it caused, you would think that most anything was justified to prevent it. The Dayton people raised \$1,000,000 for a defense and investigating fund. They put surveyors into the field and they found that the only way to protect Dayton from floods was by reservoirs. That is the absolute fact. But they do not mean reservoirs in which you hold the water back indefinitely. They mean detention basins where the water is held back temporarily. But when the engineers make a statement of that kind, as they have been doing for years, they mislead the public. They can justify themselves on the ground that that was not the kind of reservoir they meant, but the public and most everybody includes all reservoirs of every kind in the term "reservoir," and we have been trying for years to overcome those wrong impressions created by the failure to be explicit and fair in the statements of the engineers.

Mr. CLINE. The chief distinction is that it all depends on when you let the water out.

Mr. MAXWELL. If you intend to hold it back for any considerable period, it is a reservoir.

Mr. CLINE. You still have to have the space?

Mr. MAXWELL. You still have to have the space, and anyone reading the declarations of the engineers that were given out after the Dayton flood would have inferred from these declarations that there was no place to hold it back. But there is, and the best engineers of the United States have absolutely so concluded. They say that impeding reservoirs can be built which will take care not only of the flood of 1913, which is the greatest flood in the history of the country, so far as we know, but they say that the reservoirs are able to take care of 45 per cent in excess of the flood of 1913. Think of it.

Mr. FOSTER. Do you think that the engineers have ever thought or given any study to the scheme you are talking about now?

Mr. MAXWELL. I do not believe that Gen. Bixby would have given out the statement that he did right after the flood of 1913 if he had had before him the report of the Morgan Engineering Co., which has been adopted by the Dayton people for the complete protection of Dayton from floods. He would not have said that the reservoirs do not exist in which you could store these floods, because they do exist. It is that spirit of intolerance that has caused the country to suffer millions of dollars of damages because they have been repeatedly told that relief was impossible.

The CHAIRMAN. In justification, or rather excuse for some of the engineers, at any rate, isn't it a fact, and of there is any doubt about it, I will read the document to you, that the engineers, after this flood, after they were sent out to make this investigation, came back and reported that they thought it was very desirable to have an elaborate survey made of the area, with a view to determine whether or not, and just how these floods could be controlled, and they thought it of sufficient importance that Congress should authorize it.

Mr. MAXWELL. All young engineers who were sent into Ohio to look the ground over possibly made that report.

The CHAIRMAN. Was not that report approved by the Board of Engineers and the Chief of Engineers of the Army?

Mr. MAXWELL. It might have been, after it was made.

The CHAIRMAN. Of course, they could not approve it before it was made.

Mr. MAXWELL. I do not criticize the Army engineers for making any statement as to facts of which they knew. What I am criticizing them for is for giving out to the world at large positive statements, when they had no knowledge upon which to base them, and when they made those statements they were absolutely misleading the public by them. There is no getting away from that.

The CHAIRMAN. Do you or do you not agree with Mr. Cooley's estimate that things necessary to control the waters in these upper tributaries can be accomplished, but it will probably require a generation or so to do it?

Mr. MAXWELL. It would require a very short time if the Government would go about it in the right way.

The CHAIRMAN. Can you give us an estimate, and if you have not an estimate, can you give us a guess as to how much it would cost?

Mr. MAXWELL. Well, if you should take Leighton's estimate of the cost of the reservoirs—\$500,000,000—or \$1,000,000,000 even, I would not hesitate to take the ground that rather than have a repetition of such a disaster as the flood of 1913 the Government had better spend that amount for protection.

The CHAIRMAN. That is the plan in the Ohio Valley alone. How much, if you could get at it, would it require to control the floods in the upper Mississippi and the Missouri and their tributaries?

Mr. MAXWELL. The beneficial use of the water, if it could be made available by the building of the necessary works, would justify the expense of building the works.

The CHAIRMAN. We always suppose the benefits will equalize the cost, of course; but we are trying now to get at the cost, because Congress will be inquisitive, you know, and you can not go into the House of Representatives and pass a bill calling for an appropriation without somebody asking you the question, "What is it going to cost?"

Mr. MAXWELL. Those facts are of record in the departments.

The CHAIRMAN. Can you give us, then, just an estimate of what it would be?

Mr. MAXWELL. I would not want to do that offhand from memory. A year ago I could have done it, because my mind was filled with it.

The CHAIRMAN. Can you give us an approximate estimate?

Mr. MAXWELL. No; I could not. If I had time to look it up I would be very glad to do so.

Mr. CLINE. You are asking for these detention reservoirs?

Mr. MAXWELL. No; not detention reservoirs.

The CHAIRMAN. I am asking for the cost of everything that is necessary to do what you suggested and what Mr. Cooley suggested. He said that it would require perhaps a generation to do it. You say that it can be done in a few years. If it can be done in a few years, I want you to give us a guess of what it would probably cost, so that we can then form our opinion as to whether or not it would be advisable to ask Congress to do it in a few years.

Mr. MAXWELL. Would you not be willing that I should take the time necessary to prepare that statement and go through the records and give it to you with some accuracy, because it is all in the records?

The CHAIRMAN. In Mr. Leighton's estimate of the Ohio Valley, he did not confine himself within the limits of \$500,000,000, for instance; he said \$500,000,000 or \$1,000,000,000.

Mr. MAXWELL. His estimate was entirely superficial.

There is a point that you never want to lose sight of. If the machinery were created, such as would be provided for under this Newlands-Broussard-Rainey bill, and the Government sent its engineers to Ohio and made estimates as to what it would cost to control the situation there, and made complete reports about the floods, and what was necessary to be done to control them, and you should then say to the people out there, "We will do so much if you will do the balance," I do not believe that there is a flood menaced section in any settled part of the United States that would not put up more than half of the entire cost of doing the work.

The difficulty is in getting the communities interested. I do not believe that they would have ever made any headway in Dayton if it had not been for Mr. John H. Patterson. He has done wonders out there. You can not ordinarily get a community together after a flood is over and do anything. They want to forget it, for fear some man will find it out and will not buy a piece of land, or something of that kind.

The CHAIRMAN. You propose to appropriate \$60,000,000 a year, and, of course, if we are to report this bill, we want to be in a position to give Congress some sort of an idea as to what it is going to cost. If we ask for \$60,000,000, somebody is going to ask us how much it is going to cost to do the work, to do the whole job, and upon what we base our estimate. This committee, if it reports this bill, must be able to make some sort of an intelligent answer to that inquiry.

Mr. CLINE. If you want an appropriation of \$60,000,000 a year, and it costs \$500,000,000 or \$600,000,000, as a minimum, to build these detaining basins on the Ohio River alone, it will take about ten years to do the work on that one river.

The CHAIRMAN. That is the reason I wanted to get Mr. Maxwell's estimate, so that when these questions are asked, we will be able to give some sort of a satisfactory answer to the question.

Mr. MAXWELL. I want to make this point clear. Supposing that you should create legislative machinery necessary for the Government to make a complete study of the Ohio River exactly as the people of Dayton have made a study of the Miami, and the people of Pittsburgh have made a complete study of the Allegheny and the Monongahela above Pittsburgh. The people of Pittsburgh alone spent in making an investigation and publishing their report, \$150,000. You will find it very difficult, Mr. Cline, to get the people to raise the money to finance the survey and study of a whole river.

Mr. CLINE. That is true; I know that to be true.

Mr. MAXWELL. They did it in Dayton because they got that awful lesson, and you can not say that it is going to cost to control the Ohio what it is going to cost on the Miami, supplemented by what it is

going to cost at Columbus, and also supplemented by what it is going to cost at Pittsburgh—that it is going to cost the Government that. No. All you need is a chance to get before these people and to have the survey made, and when the survey is made, give them a chance to cooperate with you and to put up, as they are going to do at Dayton, the greater part of the money. If you should go on the Muskingum to-morrow and make this survey, which could be made in a few months, and go before the people along the Muskingum and say “Uncle Sam is willing to do so much; will you do the rest?” And they would do it.

I would like, Mr. Chairman, to have permission to file after the necessary time, in order to get it into the record, the statement which you have asked me to give offhand, which I did not like to do from memory.

The CHAIRMAN. We will be very glad to have you do it. Do you have in your mind what the probable cost would be to make this survey?

Mr. MAXWELL. The Pittsburgh work, which covered 19,000 square miles, an area as large as Japan, pretty nearly, together with the publication of the report and everything, cost close to \$150,000; but that involved a very intricate survey.

The CHAIRMAN. But that, according to the testimony we have, was not in detail enough to enable them to do more than make an intelligent guess.

Mr. MAXWELL. Well, it would not have cost very much more to have made it in detail.

The CHAIRMAN. For instance, it cost in Great Britain \$186 a square mile; in Germany, \$179 a square mile; in Austria, \$40 a square mile; and surveying the Great Lakes cost \$151 a square mile. Now, the Geological Survey, which is, of course, not in very great detail—my understanding is that their contour map takes into consideration a variation and elevation of only three or four feet, costs \$15 a square mile.

Mr. MAXWELL. Wherever the topographic work of the Geological Survey has been completed, the plans can be made out sufficiently for a very close estimate of cost without any very large expenditure beyond that. The value of these topographical sheets is almost beyond estimate in matters of that kind.

The CHAIRMAN. It has been suggested to us that the surveys of the Ohio Valley would probably cost \$10,000,000.

Mr. MAXWELL. I would not be prepared to say that it would not, but even if it did I think that the money would be well spent.

The CHAIRMAN. I think that very likely it would.

Mr. MAXWELL. Gov. Cox's estimate of the damage in the Ohio Valley by the flood of 1913 was \$300,000,000.

The CHAIRMAN. Of course it would not be worth of it, if, after we got the survey, Congress should set its opinion up against that of the engineers. Should we proceed upon the opinion that the engineers would make the right survey?

Mr. Maxwell, we have got to go to the House. Is there anything further that you would like to say?

Mr. MAXWELL. No, sir; I think I have said all that I care to say.

(The extract from the Engineering Record referred to in the statement of Mr. Maxwell, which was to be filed as a part of his remarks, is as follows:)

[Engineering Record, Mar. 25, 1916.]

RECOMMEND BOTH RESERVOIRS AND LEVEES TO PROTECT COLUMBUS FROM FLOODS.

Alvord and Burdick in 400-page report find cost \$10,125,000 for project caring for flood 45 per cent in excess of 1913.

Protection from a flood in the Scioto River 45 per cent greater than that of 1913 can best be obtained by the Franklin County conservancy district, Ohio, in which Columbus, Delaware, and Chillicothe are located, by a combination of two unusual detention basins and channel improvements, according to a 400-page typewritten report recently submitted by John W. Alvord and Charles B. Burdick, of Chicago, chief engineers for the district. The following notes are taken from the general conclusions of the report. One of the reservoirs is on the Scioto River above Dublin, and one on the Olentangy River above Delaware. The cost, estimated at \$10,125,000, includes the lands, a special \$1,000,000 benefit to Columbus in the way of a water supply for the next 75 to 100 years, and numerous bridges and street improvements throughout the county.

FLOOD DATA CONCLUSIONS.

The size of the basins is such as to hold back, at Columbus, all water above 50,000 second-feet, the channel capacity to be provided for through the city. The maximum run-off is taken as 200,000 second-feet, 45 per cent in excess of the 1913 flood, and the point of calamity would not be reached until the discharge had reached 250,000 second-feet. Records show that the 1913 flood is double the next greatest flood of the past 100 years. Owing, however, to increased settlement and development of the valley at least six floods of record, some of which were not especially destructive, would, under present conditions, create a calamity in all probability equal to that of 1913. Flood menace, therefore, in the future is not to be measured wholly by the probability of a recurrence of the 1913 flood, but by the increasing menace of much smaller floods made dangerous by channel encroachments, combined with levees and other embankments. It is believed that in course of time the flood of March, 1913, will not only be repeated but probably exceeded, by reason of the following causes:

1. A rainfall of more than 6 inches in two days centered over the critical area below Prospect.
2. Greater rainfalls, such as are on record elsewhere, centering over the whole watershed.
3. Snow accumulations melted by warm rainfalls of high intensity and duration over the critical area.
4. Gradual elimination, through improvement, of existing natural detaining basins, which on the upper Scioto have hitherto aided in restraining excessive floods.

Taking these conclusions together it would seem the part of wisdom to provide, as a factor of safety, protective works which will prevent a calamity in a flood having at least one-half greater maximum flow than occurred in 1913. The safety of large storage basins further requires that there should be provided, as an additional factor of safety, liberal spillway capacity above this amount capable of further fully protecting the proposed dams.

ADVANTAGES OF PROJECT SELECTED.

Of the total cost approximately \$2,500,000 is allowed for about 21,000 acres of detaining-basin land estimated as purchased outright. Inasmuch as practically all of this land may be continuously cultivated it will retain its agricultural value. Its cost should not be treated as entirely a burden to the taxpayers. Deducting the value of land which would be able to pay its own way, the value of water-storage capacity to Columbus, the cost of rebuilding certain structures which should be financed by the city and county, leaves about \$6,000,000 as the cost of flood protection. Based on percentage of losses suffered during the 1913 flood, Chillicothe should pay 9.5 per cent; the 41,370 acres of

farm lands, 10.1 per cent; Columbus, 54.7 per cent; Delaware, 3.7 per cent; the county, 6.3 per cent; the railways, 15.4 per cent; and the villages, 0.3 per cent. Water power can not be profitably developed.

BASINS ARE LARGE.

The project requires, on the Scioto River, a very large detaining basin, which will be formed by an earthen dam across the narrow valley above Dublin. The greatest height of the dam will be 143 feet and its thickness at the base 980 feet. It will hold at spillway level 255,925 acre-feet of water, and flood 9,580 acres.

There will be conduits formed by tunnels in the solid limestone rock of the adjacent hillside. These conduits will be so arranged as to serve for both flood protection and water-supply storage.

The project also requires a large detaining basin on the Olentangy River, about 2 miles above Delaware. This will be formed by an earthen dam 82 feet in greatest height and 850 feet thick at the base. It will hold at spillway level 163,202 acre-feet, and will flood 11,299 acres of land.

Two conduits tunneled in shale rock in the adjacent hillside at the river level will permit the ordinary flow to pass through the bottom of the dam.

Every precaution will be taken to provide for the safety of these dams. They will be founded on rocks, will be made of extra thickness, and will have ample spillways. Before they could be overtopped a flood more than three times as great as that of 1913 would have to occur. Put in another way, the spillway outlets will alone pass two and three-fourths times as much water as the maximum flow in the 1913 flood.

BALANCING CHANNEL AND RESERVOIR COSTS.

It is evident that, other things being equal, the project is the best which safely passes a given flood with the least cost. Each project for reservoirs produces a different reduced flow, and, as in all these projects expenditures for channel improvements are necessary, the least cost is determined by adding to the cost of each reservoir project the cost of the channel improvements that would be required along with it. The curve marked total cost, shown herewith, represents the sum of each reservoir project with its corresponding channel improvement. It indicates very clearly that project D, costing \$8,210,712 for basins and \$1,914,400 for channel improvements, a total of \$10,125,112, is the most economical combination for accommodating a 200,000 second-feet flood. This contemplates a channel improvement to accommodate about 50,000 second-feet.

(Thereupon the committee took a recess.)

AFTER RECESS.

The committee met at 2.10 p. m., pursuant to the taking of a recess, Hon. B. G. Humphreys (chairman) presiding.

The CHAIRMAN. Senator Broussard, you may proceed.

Senator BROUSSARD. I would like to insert in the hearing a telegram addressed to Mr. Redfield, Secretary of the Department of Commerce, written by Mr. Walter Parker, general manager of the New Orleans Association of Commerce, bearing upon this proposition.

(The telegram referred to is as follows:)

NEW ORLEANS, February 15, 1916.

HON. WILLIAM C. REDFIELD,

Secretary Department of Commerce, Washington, D. C.

DEAR SIR: One of the main-line levees of the Mississippi River in northern Louisiana has just given way in a district which suffered in 1912 and in 1913. A vast area of fertile farm land is being inundated. The people are fleeing from their homes. We are sending them help, as we always do. You are one of the members of the interdepartmental committee appointed many months ago to study the various submitted plans of stream and flood control. Your committee, we have been informed, reached an agreement upon the principle of the measures which were to be supported before Congress by the executive de-

partment. This organization, voicing the settled judgment of the business community of New Orleans, is on record as favoring the principle and the form of one great measure submitted to you for your approval, and by you in principle indorsed.

Through three sessions of Congress we have waited patiently for the action to which the Democratic Party is pledged and to which you gentlemen yourselves have submitted your belief and your approval. We have waited, conscious that each year of delay in approaching the problem of flood and stream control in a broad and comprehensive manner adds another year to the many years of our continual and recurring peril. Still no action has come. We do not presume to sit in judgment upon those of you who occupy posts in close relationship to the processes of legislation and of execution in the Federal Government, but we do know that our peril continues; that we lose in money and in lives in each returning year of flood. We suffer an invasion as real as though it were directed by the head of an alien Government. We lose lives as certainly as though they had been lost in Mexico or on the high seas. We suffer the imposition of indemnities which we must meet with taxes and bond issues that are just as much indemnities as though levied by a conquering army, and through the years and in proportion to the wealth of the region afflicted, what we have lost and what we have paid surpasses the indemnities inflicted upon France after the Franco-Prussian War—the greatest indemnity ever paid by any one nation.

Here in New Orleans we feel that we as individuals and our investments are physically safe, because we have massed resources of human power and of material which enable us to keep our levee breastworks so far ahead of the long lines reaching up the two sides of the Mississippi River from here to Cape Girardeau that levees elsewhere give way before the flood level reaches us, and thus we are saved by the misfortune of our fellow citizens of the Mississippi Valley. We appeal to you now in behalf of those unfortunates in Kentucky, southern Missouri, Arkansas, Mississippi, and Louisiana who have lost their homes, their fortunes, or their lives through the onslaught of the forces of nature operating over the territory of thirty-odd States and concentrating their evil effect upon those who live in the smaller regions on the lower reaches of the Mississippi Valley.

It is now too late for Congress to do more for those who are suffering now than to give them food, if they need it, to furnish them with Government tents, and to put at their call the officers of the United States Army; but it is not too late for the interdepartmental committee to make known its conclusion and its findings with reference to suggested legislation having to do with the inland rivers of the United States. It is not too late for the executive department of the Government to put its recommendations before Congress, to lend the strength of its influence in support of the measures already drafted and pending therein which will bring to bear upon the whole vast interrelated problem of stream-flow control, flood-disaster prevention, and use of the rivers in navigation the coordinated power and capacity of the whole Federal Government. It is not too late for this administration and this Congress to undertake "after Panama" the task of "the inland rivers," carrying out the policy so well phrased and indorsed by President Wilson in his telegraphic message to Senator Newlands, dispatched in the autumn of 1912:

"SEAGIRT, N. J., September 29, 1912.

"HON. FRANCIS G. NEWLANDS,

"President Irrigation Congress, Salt Lake, Utah:

"Please express to the National Irrigation Congress my hearty approval of the policy it is met to promote, and especially of the policy of supplementing bank and levee protection by storage of flood waters above for irrigation and water power, turning floods from a menace into a blessing and at the same time abundantly feeding navigable waters.

"WOODROW WILSON."

Is it asking too much to request you to read this telegram at the next Cabinet meeting as a respectful and an urgent message from the Association of Commerce as representing the afflicted and jeopardized people to the responsible heads of a Government from which we had expected adequate measures of safety?

WALTER PARKER,
General Manager, New Orleans Association of Commerce.

Senator BROUSSARD. I would like to state that the association of commerce is composed of various commercial organizations of that city, and that Mr. Parker is the general manager of that association, and I would like to present him to the committee so that he might present the views of these various organizations to the committee with regard to this proposition.

**STATEMENT OF MR. WALTER PARKER, GENERAL MANAGER
NEW ORLEANS ASSOCIATION OF COMMERCE.**

Mr. PARKER. The city of New Orleans to-day, and in all of the years past, has maintained a differential of safety in the matter of flood control by reason of the fact that concentrated wealth there enables it to build and maintain stronger and better levees than any other section of the valley, and when large floods come some other levees go before the strain on our levees reaches the maximum, and very largely for that reason the city of New Orleans has enjoyed protection from floods.

Now, I take it if a system of levees and revetments is built from Cairo to the Gulf that is in every respect as strong and as good as the levees at New Orleans, the differential of safety which New Orleans, the port of the valley, now enjoys will be lost and that differential of safety would have to be re-created by a re-creation of the levees at New Orleans, making them stronger than any other levees in the valley, unless something besides levees and revetment are added. It is for this reason that we are asking that spillways be provided at New Orleans, which will reduce the flood levels to a plane of safety, no matter what the flood may be. Now, it is not only for New Orleans that I speak in this connection; it is for the entire Mississippi Valley.

The Panama Canal, which the United States Government has opened, has had a profound effect on the trade economy of the entire Mississippi Valley. To illustrate that, take St. Louis as the example, for instance—and all the cities in the valley are in the same category—Chicago, Pittsburgh, Kansas City, any of them. An article of commerce of any kind originating at St. Louis and passing to the Pacific coast, which of course is the market of greatest promise—China, Australia, and so forth—formerly moved across the continent by rail, and enjoyed a differential in its favor of about a thousand miles, as against the competition of the Atlantic coast.

Now, the Panama Canal has made the cheap haul between the coasts the ship haul which, of course, puts the valley cities at the end of the haul instead of in the middle as formerly. The valley cities had their greatest development by reason of their being part way on the transcontinental rail haul, which position they have now lost. This loss of position has forced the Mississippi Valley cities to turn to their natural port at New Orleans, and to use the river, as well as to encourage the railroads to develop through a better character of legislation so that these cities can reach ship side under the most economical conditions.

In order to aid the valley in that work the city of New Orleans is spending a large amount of money, has changed its local laws, has

time and again secured a change in the State laws, all with this result in view and with this effect now practically attained:

First, we have corrected the health conditions of New Orleans, and it was a big job to convince some of the people there that mosquito eradication was the way to keep yellow fever out. We were opposed in many directions, and it was said that it could not be done. We did it.

We tried to make improvements in sewerage, drainage, and pure water. Again we were opposed for years, and many people said it could not be done. We did it. We have rat-proofed the city of New Orleans at a cost of about \$7,500,000, so that the bubonic plague will never again get a foothold there. We can now trade with all parts of the world, and no matter how much plague is brought in it can not spread, because there are no rats there. They said it could not be done. We have done it.

Next, we have changed the financial laws of Louisiana, with the purpose of enabling us to finance the commerce of the Mississippi Valley and ultimately to get that commerce on a bedrock basis of, say, 4 per cent. They said we could not do it. We have done it.

We have started the development of port facilities at New Orleans, and one of the terminals is now finished, the cotton terminal, which gives the same terminal economy to the boats as to the railroads. Other commodity facilities are being built. They said we could not get the money to do this work, but we have secured \$25,000,000 with which to do it. That is another case where they said it could not be done, and it was done.

Now, in order to develop the port of New Orleans so as to enable it to serve the Mississippi Valley in the most economic and the most efficient manner, we build on the river front—that is the only place we have.

The river front has been preserved under public ownership. We are building terminal facilities there that give the railroads, boats, barges, and ships absolutely equal facilities, so that the trade line of least resistance may always work for the Mississippi Valley. If the city of New Orleans is not safe from floods, it is handicapped in the service it is called on to render the valley.

The CHAIRMAN. Before you get on the flood, I would like to ask—it does not have any direct bearing on this particular question, but is of especial interest—about your terminal facilities there. How much has the city spent, including what it contemplates spending in the immediate future, on the terminal facilities?

Mr. PARKER. Do you mean for the terminal facilities alone, or to enable the city to perform its proper function in the commercial and industrial life of the Mississippi Valley?

The CHAIRMAN. I mean the terminal facilities, because I do not know what the other would mean.

Mr. PARKER. The other would mean the expenditure necessary to equip New Orleans to serve the Mississippi Valley. That, of course, includes health and includes the channel to the sea, and all of those things.

The CHAIRMAN. But what I had particularly in mind was terminal facilities, and I was wondering just what the expense has been.

Mr. PARKER. I can give you in slight detail what the expense has been. An expenditure of about a million and a half has been made

on the municipally owned belt railroad, which has reduced the cost of belting cars from \$15 and \$20 and more per car to \$2 per car, and yet the city of New Orleans is making money at \$2.

The dock board has, to date, spent something like \$7,000,000 on permanent wharves, sheds, and the cotton terminal. It will spend about a million and a quarter on the grain elevator which is now being built. And of course there are a number of other large facilities which are provided for in the \$25,000,000 mortgage which has been executed for that purpose, the cost of which is not yet stated. The total money expended to equip the city of New Orleans ranges something over \$100,000,000. That includes fundamental economies.

Now, Mr. Chairman, I believe I was discussing what we are doing to permit this great empire of the Mississippi Valley to develop normally to take off the handicaps and the restraints and restrictions from the valley, and it is New Orleans's function, as it is the port and the line of least resistance for the valley, to create the facilities for the valley's trade movements, so that New Orleans may take up the slack between the producer and the consumer under economic conditions.

We need to know to a certainty what the water level of the Mississippi River is going to be in order that, with complete knowledge and assurance, we may build effectively, wisely, and well. We do not know that level to-day.

All we know is that our levees are better levees than other levees in the valley. We know that no other levees in the valley are as wide or as high as our levees. We also know that our levees will have to go higher, unless there is something done to check flood formation, to let some of the flood waters out of the river, and to reduce the pressure on those levees. We also know that the weakest of the weak levees with no pressure on it is stronger than the strongest of the strong levees with too much pressure on it. We do not need an engineer to tell us that.

Now, as laymen, the only thing that we have found that could be done below Red River—of a local character—to aid us in relieving our necessity is the spillway, which would give us a maximum flood level fixed beyond any doubt. We have talked about that for years. There has been a report by Mr. Sherrill, which I have never been able to see. There has been no action. What the reason of the Mississippi River Commission is for not having acted I do not know. I do not question their motives, but the fact is that they have not acted, and they have not given us this facility which, we have good reason to believe, would relieve us of worry on the score of excessive flood levels.

So far as I know there is nothing that can be done of a local nature between the Red River Landing and Cairo except to build levees and torevet the banks. Now, if that be done with the best skill and ability of the engineers, there will be, for a short time at least, less danger of breaks in the levee than has been the case in the past.

But that inevitably means a higher flood level at the city of New Orleans unless we have spillways.

We have built our harbor facilities to the maximum flood level of the past. But no engineer has yet indicated, and I have questioned many of them, as to how high the floods would go at New Orleans, or will be at New Orleans, if the levee lines above are enlarged and hold. They can not answer, Mr. Chairman. They do not know,

because every time a tree is felled in the source stream country, every time a farm is drained, it means a quickened flood run-off, a hastened precipitation into the streams below, a relatively greater volume of water coming down upon us in the shape of flood flow, with less water soaking into the ground and less dry-season flow. The drainage of the valley is changing constantly in one direction, and that is toward a greater run-off in the form of floods and a diminished run-off in the shape of dry-season flow.

We have got to use this river. That is an essential factor in the valley's commercial life. The valley must use it. It belongs to the valley. The city of New Orleans belongs to the valley. It is as much a possession of St. Louis as St. Louis's main street is—or of St. Paul or of Minneapolis.

We are at the foot of the valley—the neck of the funnel, and we once thought the valley belonged to us.

We now know New Orleans, the port, belongs to the valley, and for the first time in the history of New Orleans we are now earnestly and actively preparing to serve the valley in all of its commercial needs, in foreign trade—and you know that foreign trade is now an absolute necessity to commerce creators in the United States. To reach foreign markets the valley must have outlets, and to develop the outlets as they should be developed much must be done. We are doing our full share, with the fullest knowledge that we can gain, with the best and most careful investigations. I ask this committee not to ignore the need of New Orleans, and to give us a known maximum flood height, beyond which the flood will not go, in order that we may build to that height and build well. It seems to me that Congress will not hesitate to help us in that direction. It is not charity that we are asking. We are asking simple justice. We are asking the protection that only the United States Government can give us. We do not dare cut the levee; we do not dare put in a spillway. Only the United States Government can do that.

Mr. CURRY. Are those spillways all going to be on the Louisiana side of the river?

Mr. PARKER. The river at New Orleans is all in Louisiana.

Mr. CURRY. Where do you want to put these spillways?

Mr. PARKER. I am not in a position, and I do not presume to say how they shall be built or where. I am not an engineer. I say we must have some action by Congress that will give relief from an ever-increasing flood pressure on our levees.

Mr. CURRY. But Engineer Sherrill thought they should be on the Louisiana side of the river.

Mr. PARKER. Well, Mr. Sherrill, as I understand, is in favor of a spillway above New Orleans and one below New Orleans on the east bank of the river. Sea level at the city of New Orleans is only seven blocks from the banks of the Mississippi River, and yet to reach sea level the Mississippi River runs 110 miles to the Gulf.

Mr. CURRY. Would these spillways lead into the channels of the river?

Mr. PARKER. No; they would lead into arms of the Gulf of Mexico. My understanding of Capt. Sherrill's idea is that these spillways would be nothing but levees lower than the standard levee and that the top of these lower levees would be protected so that there would be no washing. He has explained to me that the waters would

run over these spillways only in the years of exceptional floods, and that the water that would run over would be the water that would carry only the finest silts in complete solution, that the lakes into which they will empty would not fill from these silts, and that it would be a hundred years before any important effect from the filling by reason of those spillways would be felt.

Mr. CURRY. It would not be necessary to acquire any more land from the State?

Mr. PARKER. I presume it would be necessary to secure some land, but the land is not drained and is undeveloped and could be acquired at low cost.

Mr. CURRY. Has the State passed any legislation?

Mr. PARKER. The State has not. The State has no control over such spillways.

Mr. CURRY. They would have a right to cooperate with the United States Government in providing lands for the by-passes.

Mr. PARKER. But we have never been able to get from the Mississippi River Commission any statement that they would do it, that the commission would cooperate with them in building these spillways. We could cooperate. But why should the United States Government say that we should buy land, or that we should raise our levees? The flood drainage which we are asking you to reduce is not our drainage. It is not Louisiana water that comes into the Mississippi River. It is drainage that comes from the Chicago Drainage Canal, from the far North, East, West, and from the valley farther up.

Mr. CURRY. If it wasn't for the Mississippi Valley, there wouldn't be any city of New Orleans.

Mr. PARKER. But there is a Mississippi Valley, and New Orleans was put there to serve the valley, and we are endeavoring to perform our function in the best possible way. We ask for a square deal.

Mr. CURRY. That is what we want to do.

Mr. PARKER. The drainage of the city of Chicago that has been diverted from the Great Lakes and the drainage from a huge area reaching clear up to Canada, come down the Mississippi River. That is a condition over which we in Louisiana have no control. We can not stop it if we should want to. Nor can we stop the building of stronger levees above Old River, nor do we want to. We have felt that those people that could not build levees as strong as ours are being badly treated. They should have protection. But in giving them protection by building them stronger levees—levees that would not break until a stage of water is reached higher than the new levees could stand—and there is no reasonable chance that that stage will not come, if nothing but revetments and stronger levees are put in—in giving those people the best protection that you can, we ask that we at least have the opportunity to let some of this higher flood water level out in lieu of some better scheme, or some other method by which the pressure on the levees can be reduced and the flood level controlled.

That is why we ask these spillways.

The CHAIRMAN. If it should develop after investigation that spillways could be provided at New Orleans that would take care of the flood heights that would necessarily be caused by closing the Atcha-

falaya, then there would be no objection, so far as the city is concerned, to closing the Atchafalaya, if, after fair study, it were ascertained that spillways would take care of this increased height? The only objection that New Orleans would have to closing the Atchafalaya would be because of the certainty that it would cause an elevation?

Mr. PARKER. Mr. Chairman, the city of New Orleans is not objecting to anything that will solve this trouble.

The CHAIRMAN. No; I understand that.

Mr. PARKER. We are with the committee, and with everybody else who is trying to get this thing done and done right.

The CHAIRMAN. I feel perfectly sure of that.

Mr. PARKER. I do not ask that the Atchafalaya be not closed or be closed. I do ask that the Atchafalaya be properly treated so that the people in the Atchafalaya Basin will not suffer by reason of the outfall from the Mississippi River, and I most emphatically ask that the people on the Atchafalaya River be protected. If a proposition be brought to us that, through other means of control than that of the Atchafalaya, the flood level can be set at a stage which will not be exceeded, why we are content. But there is such a headway, such a volume of water, now going out of the Atchafalaya that those of us who have thought of the matter, as laymen, do not well see how the Atchafalaya could be divorced without materially and injuriously affecting that portion of the main river below.

I might carry this a little further. We believe that local works on the Mississippi River below Old River in addition to levees and proper revetments, can solve our local problem. Above Old River there seems to be nothing but levees and revetments, but above Cairo, as Mr. Maxwell has said—and I hope you gentlemen will be interested enough to pursue that subject to its logical conclusion—there are many things that can be done that will help improve the conditions between Old River and Cairo, by partly controlling the floods before they reach Cairo, and in that case, of course, it has a profound effect on our own local problem at New Orleans.

I believe that, through source stream control, much can be accomplished, and in almost every case of source control the local benefit that would be derived directly from that form of control would justify itself, aside from its value as a flood controlling factor. It is my opinion that when we get the Atchafalaya improved, and when we get source stream control well underway, the flood will rarely get to the 16-foot mark at New Orleans, and our spillways would then spill little or no water, and would stand as emergency safeguards only.

There was one little matter that Mr. Maxwell discussed this morning that I do not believe he brought out clearly, and that is with reference to emergency impounding reservoirs. I have traveled quite extensively in Europe in pursuit of my study of this water problem. I have been all through the low countries and the mountainous countries, and I have seen a great many of the works they have put in for the control and utilization of their water. Europe successfully does what is proposed to be done in the Ohio Valley; that is, establish a system of emergency impounding reservoirs, where only in times of extreme need the lands would be used for this purpose.

In the meanwhile, being agricultural lands of the highest value, they could be used temporarily as emergency storage basins, and instead of being harmed thereby, and instead of their value being lessened by that use, their value would be augmented in a material way by the silt that would be deposited there at long intervals by the overflow, and the lands would be given this added fertilization and the new life that they all need at times. I have seen that worked in other parts of the world.

There is another problem that has confronted us that I want to call to your attention. It is the matter of the silt that comes down the river. That silt, gentlemen, comes from the farms of the Mississippi Valley, from your country. The best soil that your farms have is being washed away every year, and is coming down there to bother us. We do not want it. We have enough of it. We would like to have the balance of this soil stay on the valley farms, right where it belongs and where it will do real good.

The other day a battleship was on her way to New Orleans. She got to the mouth of the river, and the pilots said that a mud lump was in the channel and they couldn't get by. Many hours were required to force that lump to move. That mud lump was formed of the best soil of the farms of the Mississippi Valley. There is nothing better in the world than that soil, and it is going to waste and delaying ships in getting in and out of New Orleans during very high water.

It is possible, it seems to me, that every farm in the Mississippi Valley can be plowed around the hill instead of up and down, and then the water that falls on it will remain there, and help the farmer in the dry season, and by so doing will not wash the soil from his land, sending it down to worry us. Such methods can aid us very materially in assisting in the control of the floods. It is merely a question of educating the farmer up to the thing that he himself ought to do to preserve his own property.

Mr. MARTIN. Before you leave the subject of levees in New Orleans, in the event that the levees should be raised above New Orleans, what effect would it have on the New Orleans belt road and terminal facilities?

Mr. PARKER. Why it could not have a good effect because we have built only to the highest water level of the past.

Mr. MARTIN. Wouldn't there be a great many houses built in there that would have to be removed?

Mr. PARKER. They have been removed in large numbers.

Mr. MARTIN. Sheds would have to be built.

Mr. PARKER. If the flood should come up to the floors of our sheds we would have to raise the floors, and that would be an expensive thing for us to do. We are investing all the money we can get our hands on to give the valley the facilities the valley needs at New Orleans, and if you do this thing that the newspapers are indicating, but which I am glad to hear the chairman say has not been decided on; that is, simply to stop at revetments and levees in the Mississippi, you will inevitably raise our flood level and that will not square with our needs and with the needs of the valley, and the valley itself will complain of this action, because if we are handicapped in doing those things which we are actively

doing for the benefit of the valley, opening it up to the four corners of the world—if we are checked in that by change of water level—it would affect our plans, and the valley would complain because we would not have the money to do this all over again after we had finished. And, gentlemen, it is imperative in the interest of this new empire in the valley which we are creating through economic forces which can not be denied—it is imperative that you give us relief from this constantly rising flood plane. I won't take issue with the engineers. That isn't the point. I speak only as a layman, as a representative of the city of New Orleans, and we want something in addition to levees and revetments, and it seems to me——

Mr. CLINE (interposing). Have you a well-defined conclusion as to what you want?

Mr. PARKER. I have a very well-defined conclusion. It is the result of a great many years of very conscientious study as an economist, not as an engineer. Would you care for my conclusions?

Mr. CLINE. Yes; that is what the committee has met for.

Mr. PARKER. My conclusion is this: That the drainage of the United States should be treated as an asset, not as a liability; that it should be used in every way that it can be used to produce wealth and comfort and ease of living; that any of the drainage that can not be so controlled and used for navigation or for plant life or for power, or for any other justified purpose that can be found, it should then be controlled in its flow to the sea from the time it falls until it wastes itself in the ocean. My conclusion is that that should be done in an absolutely comprehensive way, not segregated into a purely local question of building levees, or revetting banks, or building spillways, or building reservoirs, or power dams, but that the whole interrelated problem should be dealt with and the power of the Government should be used. A commission should be appointed to correlate and coordinate all the scientific branches of the Government which are engaged in this internal work now, which should reduce the whole process to an economic and scientific basis, one in which the various works of the Government will be completely coordinated. Then you will get the result, and you will get it, gentlemen, in a way that will produce an empire of wealth the like of which is not now in existence.

Mr. CLINE. No one disputes that; but the cost?

Mr. PARKER. I do not know what that would be; but the result, in direct local benefits, will justify every dollar that you spend on the undertaking, aside from the general good.

Mr. CLINE. What this committee is trying to find out is the method by which we can do that very thing.

Mr. PARKER. I do not believe, gentlemen, that you or any other body of men can sit around a board and try to find a panacea for this. It is within the power of Congress to create the machinery which can go ahead and do, in a coordinated way, the things which will produce the net result that you should have, and I do not believe you will ever get it in any other way. There is no way that I can see that you can sit here and frame an adequate measure if you give only a little relief to this, that, or some other section without relation to the whole problem. The problem is nation wide. The thing that bothers us in part is that it originates in Canada.

It does not originate with us. It is a nation-wide proposition. Every inch, every square inch, of earth and land in the drainage basin, 41 per cent of the area of the United States, contributes to the problem in front of the city of New Orleans. Now, how in the world can we deal with the problem unless we deal with every angle of the problem in every inch of that 41 per cent of the United States?

Mr. CLINE. May I ask you a question? The Congress of the United States has appointed this committee, consisting of a certain number of men, to meet this proposition. They are waiting on this committee's recommendations as to what they shall do. They are waiting to get the recommendations of such men as you and other gentlemen who have appeared here, to give their views on the proper methods to meet the situation, and for us to embody the recommendations in a bill and report it back to Congress. And that is what we are trying to find out.

Mr. PARKER. That is exactly why I am here, and I should be glad to come back at any time.

Mr. CLINE. It is not enough to deal in generalizations. We have got to have specific statements from men, if we can get them, before we can properly report to the House on this proposition.

Mr. PARKER. Yes, sir; but in the discussion of the thing that you are to do, isn't it well to bring out all the angles or aspects of the thing?

Mr. CLINE. Of course that is a very proper thing to do.

Mr. PARKER. We have tried levees alone, and they have broken. Now why not let's go a little further and try this time to create a force in the United States Government with power, not to do new things, because there is not anything new that is necessary to be done, but to coordinate into one consistent whole the work that the United States to-day is doing in its various expert departments. The Mississippi River Commission is taking one angle of it, the Geodetic Survey another, the Forestry Bureau is doing something else, and the Reclamation Service is doing another thing, all practically without any relation each to the other, and yet every one of them has a direct bearing on the problem that we are discussing. Wouldn't it be a thing that a business man, in dealing with it, would pull his organization together so that he would get effective results that he was not getting before, and wouldn't it be a good thing then to ask Congress to create the machinery so that all the work that it is now doing may be pulled closer together in a more understanding way, in a cohesive way, so that each works with the other with regard to the end in view? I believe that will solve the problem.

Mr. CURRY. Do you think that Congress should defer action on the Mississippi from Cairo down to New Orleans until after this board shall have been created?

Mr. PARKER. This board could be created just as soon as the bill could get through Congress, and it would not stop the shoveling of 1 pound of earth on the Mississippi River levees. I am in favor of the best levees and the best revetments that can be built. But we need something more than that.

Mr. CURRY. But the proposition now is to do something for the Lower Mississippi from Cairo down. You think that ought to be deferred—

Mr. PARKER (interposing). No; I didn't say that.

Mr. CURRY (continuing). Until the board has been created?

Mr. PARKER. I just say this, that if you do that thing from Cairo down, you raise our flood level at New Orleans.

Mr. CURRY. There is no particular plan that has been adopted as yet.

Mr. PARKER. Do you mean from Cairo down? So far as I am aware there is nothing that can be done but build levees and revet the banks between Cairo and Red River Landing.

Mr. CURRY. One thing that you suggested is spillways.

Mr. PARKER. That is what we believe would solve the problem at New Orleans.

Mr. CURRY. Could those things be postponed until a board is appointed?

Mr. PARKER. I can not take the position of advising the committee on anything of that kind. I say this, that if you build levees between Cairo and New Orleans as strong as the New Orleans levees are, why then we must plead for something more than that, and the only thing we know that can be done locally besides building levees and revetments is the creation of spillways. That is the thing recommended by Mr. Sherrill. Don't you see that the moment you touch this problem in one of its aspects, without relation to the whole, promptly you increase the complications of some other people? We do not appear here to ask you not to build better levees and revetments for Vicksburg or Natchez. The Lord knows they have trouble enough there. Most of the breaks come there between Old River and Cairo. We ask you to help us all. Their problem is ours too. But if you are going to help them by making their levees relatively stronger and higher, as you can make them until the water there, by its process of constantly increasing, as it had done in the past, you will raise our flood levels, you will destroy our differential of security, and you will compel us to change our levees. We ask that these spillways be given to relieve this increasing strain. Capt. Sherrill is reported to be in favor of them. Capt. Sherrill is the best posted man we had there. As soon as the upper-Mississippi River levees are strengthened our troubles at New Orleans increase. As they are to-day, our levees are superior and we do not fear. But if you raise their levees, we ask that something be done to relieve the increased strain at New Orleans.

The CHAIRMAN. But I do not understand that you are advocating any delay on the work on the lower river.

Mr. PARKER. No, sir; I am advocating expedition, not delay. But I do urge that in any plan that may be adopted, no matter whether you begin to-morrow on building a standard system for the valley, or merely a standard system of levees and revetments which they have needed for many years, you make such work a part of a comprehensive plan, not an isolated thing.

The CHAIRMAN. You mean to include in the same bill a provision for these other matters.

Mr. PARKER. I think that would be best.

The CHAIRMAN. Let me ask you, would you be willing, in the situation that New Orleans is in, to hazard the vote on a bill which would carry relief as far as the plans of the Mississippi River Commission can give it by coupling with it a provision which contemplates, as

you say, millions or billions, you can not say which? Don't you think it would be running a great hazard if we were to go to Congress and say "We want you to do this specific thing for us, but we want you to couple with it a proposition that is going to cause the expenditure of millions or billions of dollars?"

Mr. PARKER. I don't wish to hazard anything, sir. But I suppose when the Post Office Department was contemplated, had the same thing been asked, that is, what would be spent ultimately by the United States Government on the Post Office Department, and some man with relative vision enough to look into the future to see what the Post Office would cost in the course of years, had said that they would spend a hundred million dollars, what do you suppose that poor little Congress, pressed for funds at the time, would have done? They saw afterwards big expenditures were justified. I don't ask that provision for the completion of everything that can be done and is justified in being done, be made now. But I do hope that at least the machinery that will get us somewhere, that will lead those of us who have been sweating on this job for years to know that the time is not far away when we shall get what we have been waiting for will be created. When we get that we shall be satisfied.

I have an abiding faith in the absolute fairness of Congress. I believe that when Congress makes mistakes it is the result of not knowing the last detail—the ultimate of the thing that they are discussing. It is difficult for every Member of this great body to know in intimate detail everything about everything that they have under discussion. That stands without argument. I feel that if Congress can be made to understand the scope of this problem and what it is that we are advocating there will be no difficulty in getting through the provision for the machinery that we need to put it into effect. If this were a highly developed country like Germany is, for instance, and the problem of this kind presented itself, there is no doubt whatever that the Government would effect the machinery that we have under discussion and do it economically. Our's is a somewhat slower process. But we have discovered it after many years, and we are ready for action that will lead somewhere.

The CHAIRMAN. My opinion would be this—I will venture it for what it is worth—that if we would go to Congress and couple with this bill that we are trying now to frame a proposition which would necessitate our making the statement to Congress that you have made to us, "In addition to what you are now authorizing, you are embarking upon an enterprise that is going to cost you millions or billions, I can't tell which," it is my opinion that the end of that bill would be at hand. Now, that is just simply my guess.

Mr. PARKER. Mr. Chairman, do you believe that if you would present a bill to Congress and say, "This bill must be passed instant, and action must be taken instant, if further disasters are to be prevented," and if you would say that there are other things that can not be done instant, but for which we must have the machinery, but for which we do not know what it will cost, and you ask Congress for the machinery, I do not see what hazard there would be in that.

The CHAIRMAN. I do not think there would be any.

Mr. CURRY. That is a different proposition.

Mr. PARKER. There is machinery and there is machinery. I have heard the Mississippi River Commission criticized, but I have no intention of criticizing them myself. But I want to tell you this, that the people of the lower river valley have stood in awe of the commission. Why? Because they have been distressed and they have been looking for certain things from the Mississippi River Commission, and they might suffer from the displeasure of the commission, and so they have stood in awe of them.

Now, on the other hand, the Mississippi River Commission has had thousands and thousands of propositions for the solution of the flood problem of the Mississippi River put up to it. Some of them were the most idiotic things in the world, and it is natural that the Mississippi River Commission should come to regard all laymen as being in the category of the herd of the thousand and one men who want them to do foolish things. It is not unnatural that the commission should reach a conclusion that any layman who had a proposition to make was to be classed in the great big class of people who were stupid. That is one of the things that has caused a little bit of the trouble, this lack of disposition on the part of the Mississippi River Commission—

The CHAIRMAN (interposing). The personnel has changed frequently since you have known it? There have been engineers on it from the city of New Orleans?

Mr. PARKER. Yes, sir. For many years the question of outlets has been urged by many people. Now those of us who have conscientiously studied this problem do not want uncontrolled outlets, and yet there are men to-day who will talk to any audience that they can get about how stupid the engineers are because they will not put in uncontrolled outlets. Quite naturally, that makes the engineers feel harassed.

We want the Government to control every drop of water from the time it falls until it gets to the sea, and to see that the water be used to produce good instead of harm for the people of the United States.

The CHAIRMAN. I will say this—I am speaking for myself as a layman—the question of spillways appeals very strongly to me. It seems it would be a good thing to do. I don't know that there is anything to indicate a prejudice in the Engineer Corps against spillways. We have another very large project for flood control which has been thrashed out by the engineers, now pending before Congress, and one of the agencies which the engineers have provided in their plans for the control of the flood is a spillway system.

Mr. PARKER. But, Mr. Chairman, we haven't yet got the spillways at New Orleans. The Mississippi River Commission has been on the job since 1879, and we haven't got the spillways yet, and there hasn't been one moment of the time since 1879 until to-day that the same relative problem that confronts us to-day has not confronted us.

Mr. CLINE. The spillway is an uncontrolled outlet, isn't it?

Mr. PARKER. It is controlled, not uncontrolled. We do not want an uncontrolled outlet. We want the flood of the stream controlled, held in restraint. It takes more than spillways to do that. It takes a fixed channel, it takes levees, it takes revetments, and it takes spillways. It takes source stream control. It takes the whole thing. But

I am pleading here for the local thing that we need now, and will urgently need in the event you raise and strengthen the levees above us.

Mr. CLINE. If the river gets to a certain height and you relieve the water by a spillway of the river, it is uncontrolled?

Mr. PARKER. No; it is controlled.

Mr. CLINE. As far as creating the flood is concerned it is uncontrolled.

Mr. PARKER. No.

Mr. CLINE. But for the reason that you draw it down a certain channel, it is controlled?

Mr. PARKER. Yes. Heretofore the river has been creating its own outlets and reservoirs in the shape of crevasses. We are tired of that. We want them to be where it is most convenient to place them.

Mr. CLINE. What do you mean by the use of the term "differential of safety"?

Mr. PARKER. I mean that because of the importance of the city of New Orleans, its wealth, its position as the port of the valley, and what it has to do to maintain a levee system, which was the only means of protection that we had, we made these levees better, wider, and stronger than any other levees of the Mississippi River, so that the crevasses would not occur at New Orleans. Whenever the river wanted to relieve itself in some direction it would do it before the big flood got to us.

Mr. CLINE. I didn't understand the scientific use of the term "differential."

Mr. PARKER. I would like, with your permission—

The CHAIRMAN. I should like to put in right here a statement of Maj. Ockerson to the effect that since he has been with the Mississippi River Commission there have been 32 different members of the commission and 65 different Engineer officers of the Army under the commission.

Mr. PARKER. Please don't think for one moment that I am criticizing the Mississippi River Commission. I am not criticizing any engineer. I am appearing here purely as a layman, as a man who represents a lot of other men who have great interests at stake in the Mississippi Valley. We are trying to get somewhere on this problem, and we have not succeeded so far. We hoped that as the result of these hearings the differences will be cleared up and we will make effective progress.

Mr. HUSTED. Now, you say that this problem is Nation wide and appeals to us?

Mr. PARKER. Yes, sir.

Mr. HUSTED. But each watershed must, of course, be treated as an independent problem?

Mr. PARKER. As a unit, from source to mouth.

Mr. HUSTED. Now, the Mississippi River Commission has been in existence for a good many years?

Mr. PARKER. Over part of the river only.

Mr. HUSTED. Over part of the river only; but they have had some of the best engineers of the Government studying this problem as members of that commission. I think, as the chairman says, there have been some 65 engineers altogether on that commission connected

with the commission at different times. Now, while their jurisdiction has been limited to a part of the Mississippi River, still they have studied this problem in all its aspects.

Mr. PARKER. No; I must differ with you there. They have studied it from the point of view of the man or the Nation—it is a good example—of a man who looks upon the drainage of the country as a liability and as a waste, not from the point of view that it is an asset to be conserved and used.

Mr. HUSTED. I am not speaking in general terms.

Mr. PARKER. That is very specific.

Mr. HUSTED. What I mean is this: That Col. Townsend, of the commission, and another gentleman, Maj. Ockerson, who is a member of the commission, have testified before this committee that the commission has taken up and studied and reported upon every one of the different things which you have spoken on here to-day as a means of controlling the floods of the lower Mississippi Valley, and after a very careful study and consideration of every one of these particular things which you recommend as a possible means of controlling those floods they have come to the conclusion that none of those things would be of the slightest use except the building of levees in accordance with the Government's standard specifications, and the revetment of the banks, and we have been trying to get at the fundamental facts of this problem in the Mississippi River watershed. Now, one of the fundamental facts is that the waters which cause this damage are precipitated during very short periods—within a few days—and it seems to me that it is a very important element of the problem. Another very important element of the problem is that those waters are precipitated at the time of the year when the grounds upon which they are precipitated are largely frozen, so that, it seems to me, that practically eliminates circular plowing, for example, because if the grounds are frozen—whether the ground is plowed in the way in which you suggest or in the way in which it is usually plowed—the water will run off the surface and not sink into the ground.

Mr. PARKER. If it is frozen, the water stays right there. The water stays there, and when it thaws it would sink into the ground, because the furrows would hold it for a time. It can not run in frozen temperature.

Mr. HUSTED. That isn't true, according to the statement of Col. Townsend, and that is not true in accordance with my experience, because, you know, we have floods in the spring of the year, and two things always occur: First, that the ground is frozen, and, second, it rains. We have a heavy rainfall upon the frozen ground and the ground sheds the water quickly, and the water goes right into the stream and a flood results, and Col. Townsend testified that that is what causes the floods in the Mississippi River—that the water falls in this precipitation and instead of seeping into the ground quickly runs into the stream.

Mr. PARKER. That is a very hopeless point of view.

Mr. HUSTED. That is the point of view of the commission.

Mr. PARKER. I refuse to believe that there is no way by which this thing can be solved. It can not be solved if we do nothing except treat the main river as a sewer.

Mr. HUSTED. I do not mean to say that it could not be controlled in any way. What I want to get at is this, that in view of the fact

that a commission has been created which has been in existence for a great many years and has had the services of the best engineering talent of the Government at its disposal and has studied the problem in all of its aspects, and has turned down all of these propositions, and has come to this well-settled conclusion, so far as they are concerned, and have formulated a finding, a well-considered policy of treatment, which involves simply the building of strong levees and revetments on the banks—in view of all this, what would you recommend for this committee to do under the circumstances?

Mr. PARKER. I would recommend that you get some additional advice besides that of the Mississippi River Commission. The thing that you have just told me that you have got from Col. Townsend does not square with our need. I am going to tell you what Col. Townsend told me in Quincy, Ill., one night last year. I was at a banquet with him and he was sitting next to me. I had been joking and talking to him about the flood problem, and I had asked him a question about the spillways, and he gave me an incomplete reply. But in a few moments he leaned over to me and said, "I am about convinced," or "I am about to announce my belief"—words to that effect—"that we must have source stream control." Col. Townsend made that statement to me.

Mr. MARTIN. Mr. Husted, do you recall that Col. Townsend has not said anything about spillways?

Mr. HUSTED. I put this question to him, "To sum it all up, in your opinion, is there any other practical way in which the floods of the Mississippi River can be controlled except by the revetment of the banks to prevent erosion and the building of strong levees?" and Col. Townsend's answer was, "No." I think you will find that in the record.

Mr. PARKER. Then, gentlemen, I think before you close the case on this matter you should exhaust all means of getting expert testimony which may possibly differ from the expert testimony you have gotten from the commission. That would be something that I would like for you to do under those circumstances.

Mr. HUSTED. Now, in view of the fact that surveys have not been made over this entire watershed of the Mississippi River, and in view of the fact that it will unquestionably involve the expenditure of a vast amount of money to control the floods in the ways in which you suggest and the way in which Mr. Maxwell suggests, provided those ways are practical, do you think it would be better for us to report a bill providing for the appointment of a commission to study all of the different ways in which the floods of the Mississippi River in this particular watershed can be controlled and simply report their findings to Congress, or do you think it would be wise for us, in view of the affirmative testimony that we have received from a commission appointed by the Government for the purpose, to go ahead and spend any money in attempting to solve this problem?

Mr. PARKER. There is work on the lower Mississippi River that can be done immediately the money is available. I would, of course, hate to see any delay in making that money available and would not advocate any delay of that kind, but at the same time I do believe that we should create the machinery that can handle this whole problem in a comprehensive way. It doesn't mean that you have got to appropriate the money to do something that you don't know whether it can

be done or not, but I believe that you can name a commission in which you would have absolute faith and leave those matters to the commission.

The CHAIRMAN. What would be your idea as to who should constitute the commission?

Mr. PARKER. The United States Government; that would be my idea.

The CHAIRMAN. Composed of what men?

Mr. PARKER. My idea would be that it should be composed of the Secretaries of those departments of the Government which are now doing various angles of this work.

The CHAIRMAN. If we were to let them constitute the commission right now, as a result of the election this fall there is a possibility that they would be out after the 4th of March.

Mr. PARKER. That would not alter the broader aspects of the case. Work on the lower Mississippi River, for instance, is in the hands of the Mississippi River Commission. That commission would go on just as it is ordered, just as they are given the money. They would not be handicapped. They would not have to bend the knee to anyone that they do not bend to now. There would be this isolation of this department and that department. There would be a new and cohesive working force pulling to the same end.

The CHAIRMAN. We are trying to find out just how you would have the commission made up to make this comprehensive study. Would it be composed of engineers or men who are not all engineers?

Mr. PARKER. Why not? I do not see that you need to compose it of engineers alone. It should be made a broad commission and take in some engineers of high standing. It is the same thing as a board of directors of a great business institution. They do not personally investigate scientific subjects, but they have got their business in such shape that they can order the scientists to do this work.

The CHAIRMAN. We have appointed a commission to do this very thing.

Mr. PARKER. The Mississippi River Commission?

The CHAIRMAN. And that commission reports to us that, under the authority that they have, they have made an investigation of all related subjects and have studied all of those subjects. They go so far as to say that they haven't any doubt. I was just reading Mr. Husted's question. I will read it again:

Mr. HUSTED. Now, Colonel, during the course of your experience and your study of the Mississippi problem has any doubt ever arisen in your mind as to the correctness of the conclusion of the engineers that the levee system, with bank protection by revetment work, affords the sole means of effective protection against floods?

Col. TOWNSEND. No, sir.

Now, having appointed this scientific commission, which is composed partly of engineers and partly of men who are not engineers, partly of Army engineers, and partly engineers appointed from civil life, and this commission having made its report to us, do I understand you to say you think we had better get other advice?

Mr. PARKER. I would go further.

The CHAIRMAN. And you suggest that that commission be composed of the various secretaries of the President's Cabinet?

Mr. PARKER. That is my idea, as a suggestion—men who are at the heads of departments which are now doing this work.

The CHAIRMAN. You don't think that the members of the President's Cabinet would be able to throw any light on this subject?

Mr. PARKER. If they sat around the table, Mr. Chairman, and coordinated this work and gave their instructions to subordinates—the Mississippi River Commission—that this thing be done, and an attempt be made to do it, and in the investigation they brought out some point in connection with that, you would get harmonious results, in that you would get everything that could be done and everything that could not be done brought out into the open.

The CHAIRMAN. Just why do you think that another commission, composed of other scientific men—the mere fact that they come from various departments—would be able to reach correct conclusions more readily than a commission that is taken from all parts of the valley—Maj. Richardson, from your city; Col. Taylor, from Indiana; Maj. Ockerson, who is quite an engineer, as you know. The President of the United States selected him to go over and correct that trouble on the Colorado River. We have selected these men. We have given them, in addition, the assistance of the United States Army Engineers, and then we have taken engineers from the Coast and Geodetic Survey, and they have studied the question for 35 years or more and have arrived at a conclusion and have reported to us the results of their study; and they say they have taken into consideration all these other subjects; and they say, "We have reached this conclusion, and have no doubt about it." Others have come to us with decided conclusions. Everybody isn't going to agree. Then we are confronted with this proposition that men who are not satisfied with that will say the only safe thing is to get another commission. Your proposition means, it seems to me, that the discussion of this problem is to emulate Tennyson's brook.

Mr. PARKER. I think it has emulated Tennyson's brook in the past. It is to bring the running of that brook under control and the discussion to an end that we are pleading for this other step. The Mississippi River Commission has been in control of the river from Cairo to the Gulf since 1879. The only thing they have given us is levees and revetments, and they have never been given money enough to carry that system into effect; and that system alone, unaided and unsupplemented, does not square with our need. We can not be criticized for wanting something more.

The CHAIRMAN. Don't understand us as criticizing or assuming any attitude of hostility at all. This committee is just as anxious to take care of New Orleans as of other cities. We wouldn't do anything to hurt New Orleans; but you must bear this in mind when you speak of the lower valley system: We have been having hearings here for some time, and we have had people here from all over the valley and people from the city of New Orleans who have given this matter very careful thought. I don't think anybody will question the fact that it has been the uniformly expressed desire, as I recall it, by every witness: "We want the Mississippi River Commission to go on with their plans. We indorse what they are doing, and we want them to go on." Now, that has come from all parts of the valley and the lower delta.

Mr. PARKER. The only thing they can see that can be done is to build the levees higher. It is the constantly rising flood plane that we are pleading against.

The CHAIRMAN. They have observed that. There is no reason, for instance, to suppose that the gentlemen who have been here from the city of New Orleans have not observed that the floods have gone higher. I observed it when I was at home a few weeks ago. I noticed the water stood 15 feet above my yard level, whereas it used to stand 2 feet or possibly 3.

Mr. PARKER. Where is the end?

The CHAIRMAN. Where is the end of that rise, you mean? There is only one answer to that that we can make, and that would be the answer of the engineers themselves.

Mr. PARKER. They can't answer. They won't tell you that the flood will only go to 20, 30, or 40 feet. That is just the point.

The CHAIRMAN. Suppose we have a commission, and they come and tell us, "We have made a thorough investigation of this, and we can not read the future well enough to tell exactly how far it will go, but we are satisfied that the levees and revetments will hold it." Would we have to discharge that commission and get another?

Mr. PARKER. Mr. Chairman, we know that everything that is done to develop the valley results in hastening the run-off of this drainage; and to further confine those waters to the river inevitably raises the flood level. Now, we want to know where that level is going, and the engineers can not tell us. Therefore we say that it is time to look about and do something in addition to levees and revetments. The Mississippi River Commission's control begins at Cairo and goes to the Gulf. It has maintained all along that nothing else could be done. As Mr. Maxwell has shown you this morning, in the Ohio Valley there are other engineers who have found that the very thing which we have claimed could be done can be done in the localities in which they have investigated.

The CHAIRMAN. I hardly think that the engineers in the Ohio Valley have discovered some things that the Army engineers said could not be done.

Mr. MAXWELL. They have decided to do things which the Army engineers said were impossible and ridiculous.

The CHAIRMAN. Let that statement go into the record in connection with the statements of the other engineers.

Let me ask you this, too. There is one distinguished engineer who has never been in the Army and who isn't in any way connected with the United States Army engineers—Mr. Cooley. He appeared the other day, and he discussed this general subject of control of the waters in the upper reaches and all the source streams; and, as I recall his statement, it was that this treatment which you advocate would probably require a generation or so before solving our problem. The people of New Orleans would not be willing to wait that long?

Mr. PARKER. No, sir.

The CHAIRMAN. They would rather, as he suggested, have a palliative administered now. They want a hypodermic at any rate, until we can treat them constitutionally?

Mr. PARKER. But can we not give the hypodermic merely as a primary treatment with full regard to the tonic that is to cure the generation that is to follow? That is what we are asking. We want the thing done; to have it started so that it will go on in a logical, cohesive way to its end.

The CHAIRMAN. If the people of New Orleans are willing—and you speak for them; I do not question that.

Mr. PARKER. I speak only for my association.

The CHAIRMAN. If the people of New Orleans are willing to say “We would rather hazard the passage of a bill for our immediate relief by providing a section in it that calls for the expenditure of either millions or billions in the future”—if they are willing to take a chance on a bill of that sort passing, I believe they have better sporting blood in them than the people in the rest of the delta.

Mr. PARKER. No, Mr. Chairman. If I spoke for myself (and everything in the world I have got is there) I would say, take the chance. But I can not go that far in speaking for the city of New Orleans. But I do not believe it is necessary to draw such an issue. I do not believe we have to present a bill to Congress involving such a hazard. I think that the solution of the bigger problem is the goal that we should work for, no matter what we may have to do temporarily or what we may have to do as an expeditious matter or as an emergency matter.

Mr. CLINE. You have stated a number of times since you have been talking that the construction of levees and revetments were the cause of high water in the rivers.

Mr. PARKER. Not altogether. It is one of the causes.

Mr. CLINE. Maybe one of the causes. What I referred to, what I interrupted you for, was to say you do not want to make that as a conclusive statement?

Mr. PARKER. That the building of levees raised the flood level?

Mr. CLINE. No; that it was exclusively the cause of higher flood water.

Mr. PARKER. It arises from the combination of confining the channel and the doing away with the natural reservoirs, and other stream flow retarding factors on the watershed.

Mr. CLINE. Numerous causes give rise to the higher flood levels than revetments?

Mr. PARKER. Are we speaking of the matter of precipitation or the matter of the relation of flood run-off to the precipitation? It is quite a different matter, you know. In other words, it is my conviction, and I believe it is a scientific fact, that every tree you destroy and every street you pave, and every farm you drain, and every natural reservoir in the shape of a swamp you cut out you get quicker precipitation and quicker run-off. That is going on all over the country and it is not finished yet, and it has been going on since the country started to be settled.

Mr. CLINE. That is my understanding.

Mr. PARKER. The confining of the water by the levees, of course, causes higher flood levels than the open banks.

Mr. CLINE. My understanding of this whole subject is that the control of flood water is primarily and ultimately a question of civil engineering, is it not?

Mr. PARKER. Well, civil and mechanical engineering and hydraulic engineering, plus a proper policy to guide the engineers.

Mr. CLINE. Then it is the business of the Government to secure the very highest skill if they want the most correct conclusion, the very highest skill, to apply to those problems?

Mr. PARKER. Naturally, sir.

Mr. CLINE. Is it not a fact that we have, since 1887, had 55 or 65 of the very best engineers the country can produce?

Mr. PARKER. As a layman, I can not answer that question. I do not know.

Mr. CLINE. You know it is a historic fact, is it not, that we have had the very best engineers?

Mr. PARKER. It would have to be a real fact if it were a fact at all, you know. I can not discuss the capability of the engineers, because I am not one.

Mr. CLINE. Well, it is an asserted fact!

Mr. PARKER. Yes; it is an asserted fact.

Mr. CLINE. And generally accepted. Now, associated with those we have had about 30 or 35 so-called laymen, men of such judgment as Judge Taylor, such competent men as Judge Taylor is, and those who have been associated with him during this time. Do you not think it is a singular coincidence that these laymen, after spending time and giving the question such thorough study as you yourself have given it, for instance, agree with these 65 engineers that we have had on the job? Now, you are asking that we have a commission composed of, for instance, as was said yesterday, Mr. Baker, of the War Department, and a gentleman representing the Agricultural Department, and so on?

Mr. PARKER. Yes, sir.

Mr. CLINE. That class of men. Do you not think that to appoint a commission to oversee, superintend, and advise—particularly advise—as you say, the Mississippi River Commission and men who are associated with them, would be a little like taking an appeal from the Supreme Court to a justice of the peace?

Mr. PARKER. No, sir; it would be just the reverse. The Mississippi River Commission now reports to the Secretary of War, does it not?

Mr. CLINE. To the Secretary of War, and the Secretary of War depends on the Chief of Engineers for what he does in the premises.

Mr. PARKER. He would continue to do that same thing, sir. He would not change at all. The Mississippi River Commission is not the only working arm of the Government in flood control. The Forestry Bureau is also working on flood control, and it has no relation whatever with the Mississippi River Commission. The Mississippi River Commission has been in existence since 1879, and we are here to-day pleading for something more than what those gentlemen have done in order to give us that character of protection we must have.

Mr. CLINE. You know the people who have had charge of the forest control, that so far as water power is concerned it has been a pseudo organization all the time since it has been in existence, and never has, up to the present time, disposed of any vital subject it had.

Mr. PARKER. I can not discuss that.

Mr. CLINE. That is the fact about it.

Mr. PARKER. It is certainly reasonable to suppose that every scientific arm of the Government is organized along efficient lines. That is always, of course, the presumption. However, the Mississippi River Commission is merely one factor in this thing. It is not the whole thing. It has no control over the Ohio River. Yet the floods of the Ohio contribute largely toward the floods that this commission has to look after.

Mr. CLINE. I want to be perfectly fair with you; I do not want you to understand that I am an advocate solely of the Mississippi River Commission. I am just speaking from my observation and what they have done during their government, and I am not prejudiced against any other scheme you might have.

Mr. KEARNS. You are not satisfied with the levee and revetment system?

Mr. PARKER. I am not satisfied to stop with levees and revetments. I want something more.

Mr. KEARNS. You say it has been an organization since 1879 and has not accomplished what it set out to accomplish during all those years; is that it?

Mr. PARKER. I have not put it that way. If you will let me state the case there—

Mr. KEARNS. That, in a rough way of stating it, is true?

Mr. PARKER. I do not want you to so state it, because I do not want to criticize the Mississippi River Commission.

Mr. KEARNS. You take this position; You think they have had sufficient time to have accomplished the control of the floods in the Mississippi Valley. Is that right?

Mr. PARKER. I do not know that, sir. I know they were instructed in 1879 to control the floods on the Mississippi, and here in 1916 we are pleading for something more than they have given us in order to prevent crevasses. That is the whole story.

Mr. KEARNS. Do you believe if they had had sufficient money throughout these years and had built levees, had built sufficient levees and sufficient revetment work, they would have accomplished what they were trying to do?

Mr. PARKER. I do not believe you can solve the Mississippi problem by levees and revetments alone.

Mr. KEARNS. What other system would you inaugurate if you had your way about it?

Mr. PARKER. I would build the levees and revetments the best that could be built; that is an essential part of any system for flood control in the Mississippi Valley. I would control the source of streams as far as it can be done, and I would put the machinery in operation to attain that end. I would let out some of the water at New Orleans so the pressure on the lower river levees would be as light as might be.

Mr. KEARNS. What would that be, that other machinery you would put to work to control the floods higher up the stream?

Mr. PARKER. The work can not be done under the present law by the Mississippi River Commission. It would be done by the Mississippi River Commission and by other boards and commissions of experts of the Government. There is no practical relationship between the Mississippi River Commission and the other commissions that are doing work to control floods. They do not work together any more than other departments around here that are not related or hooked together. What I am advocating is some system that will cause all of this naturally related work to be done in harmony, with the full knowledge of what each is doing and of what the other is doing. That is all.

Mr. KEARNS. Would your system destroy the Mississippi River Commission?

Mr. PARKER. No, sir; it would make it more effective and help it to accomplish the thing for which it was created. It would give it cooperation and give it money, and enable it to go ahead and finish the job it is on.

Mr. KEARNS. If the Mississippi River Commission only had jurisdiction over the Mississippi River—

Mr. PARKER. From Cairo to the Gulf, that portion of the river which must carry the floods after they are formed.

Mr. KEARNS. You would have a commission created that would have power or jurisdiction over all the flood waters of the country—is that right—that come into the Mississippi River?

Mr. PARKER. Yes, sir; and over all the scientific arms of the Government that are doing such work. Just like the president of a corporation directs his various departments, the sales department and the purchasing department; they all work together; they do not work inharmoniously.

Mr. KEARNS. There is not at this time one commission that has jurisdiction over all the flood waters that come into the Mississippi River?

Mr. PARKER. No, sir.

Mr. KEARNS. You would have one commission that would have jurisdiction over all these?

Mr. PARKER. I think it would be better to have one commission that would have in charge the entire water problem, its relation to drainage, agriculture, navigation, and the whole related problem, with the ability to say to the Mississippi River Commission, "This job of building levees, revetments and spillways, is yours"; to the Forestry Bureau, "the job of putting forests here or there to help check those floods so they will come down in the dry season, is yours," and so on down the line. That is all.

Mr. KEARNS. From Cairo to the Gulf does the city of New Orleans occupy a peculiar position, a position that is different from any other point along the Mississippi River?

Mr. PARKER. In what respect, sir?

Mr. KEARNS. In any respect.

Mr. PARKER. Commercially it does.

Mr. KEARNS. I mean as far as the flood waters are concerned. I take it from your being a representative of the Chamber of Commerce of New Orleans—and as far as I am advised your folks are the only persons who have been before this committee who have advocated anything different; that is, along the Mississippi River; so I supposed by that that possibly New Orleans occupied a peculiar position along the river in some way that made her interests different from the interests of other towns or other points along the Mississippi.

Mr. PARKER. It does, sir. Possibly you were not here when I made the statement. New Orleans is serving the Mississippi Valley as its port and it is equipping itself to perform that function. Now, New Orleans, through its own endeavors, has all along been able to maintain stronger, bigger levees, than any other portion of the valley. It has had a margin of safety, a differential of safety there, by reason of the work it was able to do, which the farmer could not do, because he did not have the money.

It has been suggested as the result of what the engineers have said that what they would call an impregnable line of levees and revetments are to be built from Cairo to the Gulf. That inevitably means that our differential of safety in the relation of better levees to weaker levees would be destroyed. It would not mean that the levees would never break anywhere, but it would mean we should have to readjust our levees so as to be stronger than the other fellow's, unless something were done to relieve the pressure at New Orleans, which Capt. Sherrill, of the Mississippi River Commission, has reported can be done in the form of spillways.

Mr. CURRY. Suppose the engineers should add their recommendations to Capt. Sherrill's to their other means of control of floods; would that be satisfactory?

Mr. PARKER. But, gentlemen, still that would not solve the flood problem of the valley, because they would still be dealing with only the effect of the cause and not touching the cause itself. The cause is at the sources of the streams of the country, the hastened run-off, the uncontrolled run-off. We want somebody to get up there and deal with that angle of the problem, so that great big mass of uncontrolled water will not pour into the river at Cairo all at one time, requiring it to be confined between two earth ridges.

Mr. HUSTED. As I understand it, the engineers of the Mississippi River deny that fact.

Mr. PARKER. What is that, sir?

Mr. HUSTED. They deny that the source of the streams is the source of this trouble. They deny it absolutely.

Mr. PARKER. Where does the water come from if it does not come from somewhere where it falls on the earth?

Mr. HUSTED. They say it does not come from the source of the stream in the country, and in proof of that they present these maps.

Mr. PARKER (referring to chart). Here is Cairo. This water came from up there above Cairo. When it got to Cairo it was in the form of an uncontrollable flood.

Mr. HUSTED. What I mean is this: They say that the sections of precipitation, the areas of precipitation, shown on those maps are not in the source-stream country.

Mr. PARKER. Well, from the point of view of a man who is trying to regulate the flow of the Mississippi River from Cairo to the Gulf, all above Cairo is source-stream country. Now, it has been demonstrated beyond any question of doubt that those rivers, which competent engineers have surveyed for the purpose of finding a way to control them above the Ohio River, can be controlled. Those are the only ones that have been surveyed for that purpose. Is it not reasonable to suppose that if the same kind of investigations were made, other rivers could be controlled, and that if you can control these rivers you control the trunk line? If you control the trunk line at Cairo, do you not control the amount of water that comes down in flood flow at Louisiana?

Mr. HUSTED. That is not their position.

The CHAIRMAN. Where the rainfall fell, as a matter of fact, was on the Missouri below Sioux City, on the Mississippi below St. Paul, and on the Ohio below Pittsburgh. That is where, as a matter of fact, they fell. The streams above there were not in flood stage at all, and yet we have record-breaking floods.

Mr. PARKER. Gentlemen, I am convinced that the floods in the Mississippi watershed, if approached in a broad, big, and comprehensive way, can be harnessed. If Congress will do that thing for us I will pledge you my word that we will produce in the Mississippi Valley a new empire that will put a new standard of development as a world's record to go by. Then, the Mississippi Valley, in the new trade era that must follow this war, when scientific economy, the kind that Germany practices, will be the standard of all nations, will rise to its own. We have all got to learn the way the Germans have been able to take the things we have produced and put them in some other form and sell them back to us at a profit. We have all got to come to that sort of scientific economy. We shall be prepared in the Mississippi Valley before the balance of the world begins to wake up to the fact that it has got to change its method of doing business. We shall have economic transportation; we shall have the science of moving commerce solved. And I want to ask you, Mr. Chairman, to permit me to file a little brief on this subject, all of which is dependent upon solving the flood problem in the Mississippi Valley in such a way as to let us know where the flood level is going to, so that we can build accordingly.

The following brief was submitted by Mr. Parker:

COMMERCIAL PREPAREDNESS IN THE MISSISSIPPI VALLEY—WHAT NEW ORLEANS HAS DONE, IS DOING, AND WILL DO TO ENABLE HER TO PERFORM HER PROPER FUNCTION AS THE MARKET OF DEPOSIT FOR THE VALLEY.

[A pamphlet by Walter Parker, published by the New Orleans Association of Commerce for the information of the delegates to the National Foreign Trade Convention, New Orleans, Jan. 27, 28, 29, 1916.]

NEW ORLEANS, GATEWAY TO THE VALLEY, SECOND PORT, UNITED STATES OF AMERICA.

In order that New Orleans may develop foreign trade by properly and economically performing her function as gateway, market of deposit, and surplus-supply market for the valley, point of contact of least resistance between the valley and foreign markets, sympathetic port of the United States for Latin America, these things have been done:

To perfect health conditions.—The city has been given adequate sewerage and drainage and one of the world's best systems of pure-water supply.

Complete rat and mosquito proofing has been undertaken and is nearly completed.

In this way the health of the people of New Orleans is being safeguarded, even to the extent of rendering impossible the spread of disease that may be brought in from fever or plague infected ports in other parts of the world.

To perfect financial conditions.—The constitution of Louisiana has been so amended as to free money in all forms from taxation of every character; to free mortgage notes and similar paper from taxation and from the fear of taxation; to permit any bank in any country to establish branches in Louisiana and, by paying a nominal tax of one-fifth of 1 per cent, compete with Louisiana banks in financing industries and commerce.

The State bank law has been changed so as to permit Louisiana banks to "accept" customers' drafts against merchandise transactions.

Through a combination of public-warehouse receipts, backed by the underlying responsibility of the State, and commodity inspection certificates issued by the commercial exchanges, New Orleans has developed the highest type of commodity collateral which in time is expected to attract from banks in all parts of the country surplus funds which are seeking call-loan investment.

To perfect port facilities.—The public owns every foot of the 41 miles of harbor frontage in the port of New Orleans, and has so changed its constitution as to create a nonpolitical dock board with power to finance, erect, and operate all the river-rail-ship terminal facilities New Orleans needs or may ever need.

Cotton terminal.—The dock board has just completed its first great unit—the cotton terminal. This plant includes every practical economy the ingenuity of man could devise. One of the most striking is the bale puller, which removes in a few seconds any bale from any pile. In this way the great economy of piled storage and the great efficiency of single-bale storage are combined. The capacity of the plant is 2,000,000 bales a year, which can be doubled. The commercial exchanges, through a civil-service board, select the employees.

The idea is to give the producer and his merchant allies every possible inducement to move cotton into ship-side storage at New Orleans as soon as the bales are ready for market—maximum protection from damage, minimum insurance, interest and housing charges, and all the benefits of a primary, therefore a most mobile market.

The idea is also to give the consumer and his merchant allies every possible inducement to use New Orleans as a market of deposit and as a surplus supply market—maximum protection, including hedging, minimum costs, and a world-wide market instantly available because of supply in storage at ship side.

Cotton can not normally be resold from Liverpool's stock to New England and other American centers because of the back haul, or to countries which collect a duty on secondary exports.

Cotton, when held in New Orleans until finally marked for consumption, can be sold or resold to any consuming market at any time.

Grain elevator.—This plant is now in course of construction and will operate in conjunction with the cotton terminal in such a way as to permit ships to be loaded with grain and cotton simultaneously and into all hatches at one time. In this way the time in port of ships will be so reduced as to save them practically enough money to pay all port charges.

Coffee, sisal grass, lumber, rice, sugar, and general commodity terminal facilities on an economic par with the cotton terminal will soon be built. They have been financed.

Industrial navigation canal.—This facility has been specifically provided for by an amendment to the constitution of Louisiana which authorizes the dock board to finance it, build it, and operate it just as it operates the harbor facilities, with this exception: While no river frontage, all of which belongs to the State, may be sold to anyone, the banks of the canal and its laterals may be sold in fee simple to any manufacturer or warehouseman.

The canal will connect the Mississippi with an arm of the Gulf, passing through the city. It will become a part of the Intercoastal Canal, which ultimately will extend from Boston to the Rio Grande. From the banks of this canal, which will be belt-railroad-served, any commerce generator may use any boat, barge, ship, or railroad at will with equal ease.

Public belt railroad.—The municipality of New Orleans owns and operates a public belt railroad which connects all wharves, landings, factories, warehouses, and main-line railroads. A universal switching charge of \$2 per car, empties free, is collected. Being tax free and for the most part having its right of way on public property, the public belt railroad operates at low cost and earns a profit at \$2 per car.

Vocational school.—By bequest, New Orleans has come into possession of nearly \$1,000,000 for the establishment and equipment of a vocational school for the training of skilled labor. This school has been named by the donor, "The Isaac Delgado Central Trades School for Boys." A complete scientific study of all local industries with regard to educational needs has just been completed. The school should be in operation in two years.

Municipal government.—New Orleans has done away with the councilmanic form of government and in its stead has created a commission of five members, including the mayor. These commissioners are directly responsible for the departments of which they are the heads. Much constructive work looking to the upbuilding of the city and port has resulted.

Association of commerce.—This organization has been built up by the business men and given a corps of experts on traffic, industry, commerce, publicity, finance, education, business efficiency, etc., and put to work on the development of the commercial, industrial, and civic economy of New Orleans, La., and the Mississippi Valley.

It maintains, with the help of Tulane University, a school of commerce and business administration; an industrial department capable of any engineering work; land and immigration, conventions and tourists, and retail merchants' departments; and a wholesale merchants' and manufacturers' bureau.

Four hundred and fifty young business men became members of the association in 1915, and a department has been created through which they work. These young men are now receiving a character of experience and training in commercial and civic economy their elders were denied.

Mercurio, a Spanish magazine, is published under the auspices of the association of commerce, and, circulated throughout Latin America and the West Indies, it is the voice of the valley speaking to Latin America in a mother tongue.

The equipment of the association of commerce is such that, in addition to the every-day functions of a chamber of commerce, it can successfully deal with practically every problem of industrial, commercial, or financial economy affecting New Orleans and its natural trade territory that may arise.

Mr. HUSTED. Let me ask you this question again. You are going to control, in part, the floods of the lower Mississippi by means of levees and revetments. What is your other system? What are you going to do further than that?

Mr. PARKER. Here is a great funnel; the water falls all over it. New Orleans is at the neck of that funnel.

Mr. HUSTED. Yes.

Mr. PARKER. Now, of the water running off that, much of it could be used in useful ways for plant life, soaked into the ground for power, for dry-season flow. Many of those waste lands in the West, which have no water on at all, could have plenty of water to grow crops. Many power dams might be possible. There are irrigation dams which could be created; there are reservoirs which could be created for feeding the stream flow in the dry season so boats might float on it in the dry season.

Mr. HUSTED. By means of dams and reservoirs?

Mr. PARKER. By means of many things, not just dams and reservoirs. Just as many a scientist devoting his thought and study to the use of the water, to its handling as a liability, would discover and bring into being. Then we would get a measure of control of the great streams that empty into the Mississippi River at Cairo. From Cairo down to Old River there is relatively little that we can do except to levee and revet the banks.

When you get to New Orleans the problem changes. There we are at sea level. Seven blocks from the banks of the Mississippi River in the city of New Orleans there is tidewater in our navigation canals that come up into the city, in our lakes behind the city, around the city, below the city. The Atchafalaya is an outlet; we want that used as a controlled outlet; we want spillways at New Orleans to further reduce the pressure.

Mr. HUSTED. Going up the Ohio River from Cairo—after you go up along there—tell us something you would do to prevent those floods.

Mr. PARKER. Here is a part of the record which Mr. Maxwell filed here yesterday. It shows that Engineers Alvord and Burdick had just finished the report on the Scioto River, in which they show they could absolutely protect that section of the country up there from a repetition of the damage of 1913.

Mr. HUSTED. How are they going to do it?

Mr. PARKER. They are going to control it with impounding and restraining dams. That is where they are going to spend the money of the people of that section in order to get protection.

Mr. HUSTED. Is that land not pretty expensive through there?

Mr. PARKER. There are two kinds of impounding dams, as Mr. Maxwell explained. One is the emergency storage that may hold the excess of flood waters temporarily—one day, four hours, a week—whatever may be required to give the channel an opportunity to properly discharge itself. Those reservoirs can be built and can be constructed out of the highest-priced agricultural land in the world without detriment to the land; on the contrary, it will help the land. It would be used only in extreme emergencies. There would, of course, be no houses, no residences, found in the lower part of the valley where such land would be used for that purpose. They would be on the sides above the water level. The excess waters in great flood years could go into that temporary reservoir. In times of extreme and rare floods such a reservoir would fill and remain full until that water could be safely discharged, and in filling the silt deposited from that water would enrich the land to a point which would probably justify the use of that land for that purpose at rare intervals.

Gentlemen, it all comes back to this: Every single time that the private individual or the city or the community has believed that it could aid in solving this problem and has gone down into its pockets and spent its own money to find out, it has found that it could do the thing it thought it could do. It has had to hire its own engineers to do that. Backing its engineers with its own money, it has faith in what those engineers say. In the case of Pittsburgh they spent their own money. They know the flood can be controlled at Pittsburgh. These people at some of these little towns in Ohio now know they can get protection.

The CHAIRMAN. The Pittsburgh people asked only for a survey. They were here the other day.

Mr. PARKER. But they have gone far enough to know the thing they said could be done can be done.

Mr. HUSTED. They made the statement that it could be controlled, did they not?

The CHAIRMAN. Yes; they thought it could be.

Mr. PARKER. Their engineers report that they can reduce the maximum flood of the river at Pittsburgh by 10 feet, and that is controlling that situation.

The CHAIRMAN. But their engineers said that even if they did that the influence of those reservoirs would entirely disappear before—

Mr. PARKER. It would flatten out.

The CHAIRMAN. Would entirely disappear before it reached Cairo.

Mr. PARKER. That is one lone project, but the purpose of that was to control the flood at Pittsburgh, not to control the flood at New Orleans, but if you multiply, in its various ramifications and modifications, the thing the Pittsburgh people want done, if you translate it into flood-water values in Missouri, into power dams elsewhere, into soaking into farm lands elsewhere; if you multiply these uses wherever the local benefit justifies the thing to be done, you have your great flood problem reduced to a point where it is under a large measure of control when it reaches Cairo. Then the work of the Mississippi River Commission in carrying that portion of the flood which is not under control to the sea becomes the simplest thing in

the world; our troubles would be at an end, and the development we are working for in the valley would progress in an orderly fashion to its ultimate end. We simply want the machinery to carry the work to its ultimate conclusion. We do not want you to stop and say, "Until that thing is done, until the upper Mississippi is brought into control, we will not build levees in the lower Mississippi." That is not it. We do want the whole thing done as a related, correlated whole, everywhere there is any question which has any bearing on this thing. We want the cause treated; not to spend the balance of our lives dealing alone with the effect. That is the way the protoplasm works. It tries out a thing again and again and abandons its error only after long effort. We know that some things can be done, and we want the machinery to start with.

Mr. KEARNS. Do you believe that the Mississippi River Commission, because it has been limited in its scope of authority, has become narrow and prejudiced?

Mr. PARKER. I do not say that.

Mr. KEARNS. I know, but I am taking the suggestion from what you said.

Mr. PARKER. But please do not read something into the record which I did not say.

Mr. KEARNS. I am asking the question, if that be its scope.

Mr. PARKER. No, sir.

Mr. KEARNS. As far as the Mississippi River Commission is concerned, I do not care a snap of my finger for it, more than for something else.

Mr. PARKER. No, sir; the scope of the Mississippi River Commission has been limited to dealing with the effect of a cause, that effect of a cause being the flood level at Cairo, which had to be conveyed to the Gulf.

Mr. KEARNS. And they have not sought for a cause farther than Cairo?

Mr. PARKER. I can not say that. I say the cause has not been treated. That is all. We want it treated.

Mr. KEARNS. Do you not think they would naturally become prejudiced as to just that part of the country alone?

Mr. PARKER. I know if I were employed to deal with the problem between Cairo and the Gulf, I would spend most of my time building levees and revetments, but if I were employed to solve the flood problem of the Mississippi Valley, I would take it from the Canada line, the Rocky Mountains, the Appalachians, to the Gulf of Mexico, and go to work on every angle of the cause and then deal with the remaining effect of that cause as best I could.

Mr. HUSTED. Of course the people of New Orleans simply want the city safe?

Mr. PARKER. We want more than that, Mr. Husted.

Mr. HUSTED. Well, they want the city safe and the valley safe?

Mr. PARKER. Yes, sir; we want the water problem solved.

Mr. HUSTED. That is the thing; that is the matter of your immediate concern?

Mr. PARKER. Yes, sir.

Mr. HUSTED. In answer to a direct question, the chairman of the Mississippi River Commission, Col. Townsend, made the unqualified statement that if the Government would provide sufficient money

torevet the banks of the Mississippi River as they should be revetted, and sufficient money in connection with what was contributed by local interests to levee the Mississippi River from Cairo to the Passes, in accordance with Government standards, not only the city of New Orleans, but all the land now protected in the alluvial delta of the Mississippi River would be absolutely safe from any flood of which the United States Government has any record whatsoever. They gave us an estimate, a definite estimate, as to what it would cost to do that, and that amount of money is trivial in comparison with carrying out all these schemes which involve the treatment of the entire watershed, practically, of the Mississippi River.

Mr. PARKER. Mr. Husted, that, if you would recognize it, is merely a continued attempt to fight the effect of a cause. We have got to fight it. We have got to do what these gentlemen say do. They are on the job. It is their duty to do it. I think it is the duty of Congress to give them the money to enable them to do that which they say is needed. But the thing I am pleading for is that we do not stop there; that we go ahead and deal with the cause of the effect of which these gentlemen are telling you; and that in the case of New Orleans, if we can get spillways we can get relief from some of the pressure on our levees, and we therefore ask you for the spillways. But we ask you not to stop there, but to go to the source streams and provide the machinery by which the cause of all this trouble, and the thing that has taken up so much time, be dealt with where it occurs.

Mr. CURRY. I notice you said you would have that commission or machinery composed of certain members of the Cabinet. Now, only one member of the present Cabinet knows anything about any of these problems. That is the Secretary of the Interior, Mr. Lane.

Mr. PARKER. How about Secretary Houston?

Mr. CURRY. He does not know anything about it.

Mr. PARKER. I think you will find that he does.

Mr. CURRY. I do not think so.

Mr. PARKER. I think Secretary Redfield knows a great deal about it, too.

Mr. CURRY. Not a thing in the world.

Mr. PARKER. I have been impressed that he does.

Mr. CURRY. He may talk about it, but I do not think he knows as much about it as I do. I served 12 years on the California State board, and I do not know anything about it. What Secretary Lane knows he learned before he was in the Cabinet, a little about reclamation science. Those Cabinet positions are for four years, and even when an administration succeeds itself, and sometimes in the interim, there are changes in the cabinet. Now, if a man were appointed to the Cabinet and devoted four years of his time, to the exclusion of every other subject, to the exclusion of every other item of business assigned to him in that department, he could not learn this subject sufficiently well to advise Congress. Do you think that is the right kind of commission to appoint, or would you have that commission, after it was appointed, delegate its authority to some one else, and if so, who would the other person be?

Mr. PARKER. There are men in Congress who are far better able to judge as to what the composition of that commission should be than I am, but it does not seem to me that if the Cabinet members

have control, as they now have independently over each one of the departments, each one of the bureaus, knowing that they had the control in a coordinate instead of in a disjointed way, they would get much further in a broad solution of this problem than now.

Mr. HUSTED. That would be throwing the whole thing into politics.

Mr. PARKER. No more than now. You have political secretaries now. You do not have any other kind.

Mr. HUSTED. This commission is not political.

Mr. PARKER. However, I am not making any plea for that. I am simply making the plea that the cause of this trouble be included as well as the effect.

Senator BROUSSARD. I should like to say one thing before I introduce the next speaker.

The CHAIRMAN. Yes; we shall be very glad to hear you.

STATEMENT OF HON. ROBERT F. BROUSSARD, A SENATOR OF THE UNITED STATES FROM LOUISIANA.

Senator BROUSSARD. In regard to the fear that if anything is included in the bill that is contemplated to be framed in this committee besides the protection from floods of the lower Mississippi Valley, it might delay the work on that portion of the valley. Of course, if I believed that I would not be advocating anything else, because that is of primary importance to us living in the lower valley. But approaching this subject from its parliamentary status, I see no difficulty at all in the way, if I understand the situation correctly, while this committee is considering and devising plans to draft a bill that will make the improvements contemplated for the lower river effective. The Rivers and Harbors Committee has pending before the House a bill which carries an appropriation for the lower river of some \$6,000,000, I believe. So that while this work is going on, and should be going on in my judgment, of investigating this subject, the wherewith to meet next year's problem in the haphazard way in which we have met it in the past, is being provided, and the money will be forthcoming for whatever work is necessary to be done this coming year. As I understand the power of this committee, or the purpose of this committee, it is to draw up a bill that will systematize the work of the commission and give it a better opportunity to work itself out, and a better opportunity to secure the funds with which to work out the problems than heretofore they have been able to secure at the hands of Congress. The money itself with which to do that work is not in contemplation in this bill, but the authority for some committee to appropriate that money. So that if there were linked to the proposition of providing the money, which the Mississippi River Commission has declared to be necessary to finish up the work of the leveeing and the revetment of the lower river, and to provide all the means to be available as quickly as the work can be done, there can, in my judgment, be no difficulty in attaching to the bill the more comprehensive proposition which Mr. Maxwell and Mr. Parker have suggested, if this committee consider it ought to be included.

In other words, if the mission of this committee, as one of the arms of the House, is to provide a quicker method and a more efficient method of doing the work the commission says ought to be done in

the lower valley, and this committee should, on its own judgment, conclude that there is merit in the proposition that the proper solution of the conditions in the lower valley require that we reach out to the source of the streams that empty into the Mississippi River, and a plan is found by this committee whereby the entire thing may be brought under one supervision without doing away with the jurisdiction of the commission or its reports, or its purpose, or its objects, as devised by them, I can see no reason why that should not be done. The bill will authorize no other appropriation than the appropriation for the lower river, that is now ready for the work, and, in addition, it can create a larger cooperation with a broader scope, a scope national in its operation, that on that account anyone would be inclined to vote against the proposition because the purposes of this committee were to treat the entire subject in a broad, scientific way, rather than in a limited scientific way. Assuming that both propositions would be treated scientifically, which we must assume, and assuming, of course, that the recommendations of the Mississippi River Commission as to the lower river is scientifically solved, why can not both be included in your bill?

Now, this commission would not in effect be placed over a scientific body that would have the right to reverse the findings of this scientific body, representing, as Mr. Cline put it, an appeal from the Supreme Court to a justice of the peace. All of our governmental affairs are conducted on the theory which is advocated here. No one would contend, for instance, that our new Secretary of War is an expert on war. He must rely on the mediums furnished him by Congress for his information to handle the Army. We are about to intrust him now with a great deal of power looking toward the increase of the Army. We all know, without saying anything in derogation of the Secretary, whom I have not had the pleasure of meeting as yet, that the fact that he is not a military man rather than detracting from his ability to view military matters properly, is rather a recommendation. Everybody knows that the Secretary of Agriculture may, theoretically, know a great deal about agriculture, but we would not select him to run a farm for any of us. And it is proper that we should have a man who can be taught to rely upon the scientific investigations which the Government is making rather than to rely on his experience. And so on with every branch of the Government. There is no use enlarging upon that.

So it would not be an appeal from the Supreme Court to a justice of the peace, but it would be an appeal from the scientific conclusion of men whose minds have been given to a subject in a purely scientific way, so much so that they fail to see the practical side-lines of a proposition. We properly, under our form of government, put some man who has practical business sense to look over these scientific matters and apply the results of scientific investigation.

While the argument that has been intimated in the questions asked or the suggestion that is made that because the Mississippi River Commission, organized since 1879, has persistently refused to do anything with regard to spillways, for instance; if this committee is going to assume that because they have done that they should go no further in investigating the matter, let me suggest that if Congress and the committee of Congress had at the time taken that position with regard to Maj. Eades's project with regard to the

jetties at the mouth of the Mississippi River, we should still be without any jetties. That is a fact known to everybody. There was not an engineer, so far as I know, in the Army Corps who agreed with Maj. Eades. In fact, he finally had to submit the proposition that if Congress would only let him do the work, he could do it and deepen the mouth of the river. Without this New Orleans to-day would be without ability to permit a single war vessel to go up the river. The Panama Canal, so far as the great valley is concerned, would not amount to anything. The expenditures that are now being made in New Orleans to carry this great trade attracted by the Panama Canal, as so well described by Mr. Parker, would not now be made.

I merely cite that as one instance. I take it that when Congress created this committee, when the House of Representatives created this committee, the purpose was to reach out, as we have outgrown the local treatment of a broad cause. I do not believe that it ought to be assumed that those who advocate the broader idea do so for lack of confidence in the Mississippi River Commission; for lack of confidence in their ability; for lack of confidence in their integrity; for lack of confidence in their vision; but I believe that the Congress itself is responsible for those conditions.

Why do I say that? I was the ranking member of a committee that had similar power to this committee some Congresses ago. I think Mr. Bartholdt was the chairman. We had these problems coming continually by suggestion before that committee, such as this spillway suggestion, and I remember during the time I served on that committee we extended the jurisdiction of the Mississippi River Commission somewhere to Cape Girardeau, some place up the river. I think that was the only bill during my service that committee reported to Congress. These questions would come up to be discussed, and no matter what proposition came up we treated the matter just as Congress intended that it should be treated, that is, having given limited jurisdiction to the Mississippi River Commission to treat a section of the river, and to keep the lands from overflowing in that section, that they had limited their researches, limited their conclusions, limited their efforts, limited their plans with regard to the control of floods, simply to the proposition of keeping water off of adjacent lands, and that the law had fixed that restriction. Nay, Congress went further, while the chairman of this committee was on the Rivers and Harbors Committee, and provided in one of the rivers and harbors bills that no engineer should report on anything except directed by Congress to do so.

If, in my judgment, the Mississippi River Commission could see the proposition as I view it, as Mr. Parker views it, as Mr. Maxwell and Senator Newlands view it, if they could view it as such, they could not, without direct authority of Congress, investigate these matters and report to Congress. They are prohibited from doing that by law. So that the view they take is necessarily this view: We are given the mission by Congress and such funds as Congress from time to time allots us to keep the lands of the lower valley from overflow, and we think that under the authority which we have, the only thing that is necessary to be done is to build a wall of dirt high enough and tie that dirt to the bank by revetment so it will not slough off into the river, and when we have done that we have done what

Congress has directed us to do. But the trouble with Congress is that Congress does not give us enough money to do that work, and gives it to us in such a way that the cost of it is much larger than it should be, because if the money was turned over to us we could make much more advantageous contracts if the men who bid on the contracts knew they could work day in and day out with the organization and machinery necessary to do the work.

I am making these suggestions because of the questions which have been asked, and I had not intended to say anything with regard to this matter, because these gentlemen have come a long distance, and I want them to be heard. I can always get a chance to talk on this subject.

I do not think, however, and I do not want a member of this committee to gather the idea that there is a disposition to say, "If you can not do the big thing, then do not do anything at all." Do not think there is a purpose to say that because you can not do the larger thing that you should not do the smaller thing. But I do believe the time has come for us to treat the proposition as a national one, and treat it as such from the highest point that drains into the valley to the mouth of the river itself; and I do not agree with the chairman, if the chairman will permit me to disagree with him, as to this: I do not agree with the chairman that if the broader proposition is put into your bill with the immediate treatment of the Mississippi River—because the Mississippi River is prepared for immediate treatment—that it will be more difficult to put that bill through than if you segregate the lower river and put it alone before Congress.

I believe the people of this country are prepared for a national solution of flood conditions, not alone in Louisiana and Arkansas, but up in Ohio and Pennsylvania and out on the Pacific coast and in Kansas, and wherever floods occur. I believe that.

MR. VINSON. Do you think a bill like that would pass?

SENATOR BROUSSARD. I say I disagree with the chairman, who says it will be too big and Congress will not pass it. On the contrary, I believe if you propose to treat scientifically all these rivers, the utilization of all these waters that are now harming us in the lower valley, and harming people in Ohio at times, and in Pennsylvania at times, and in West Virginia at times, and in various other localities at times—that if you adopt the broader proposition you have a far better opportunity to secure favorable action; and, more than that, you have behind it the fact that the country will at once realize that Congress is determined to treat this subject in a scientific, businesslike way instead of treating it in a haphazard way, chucking something here this year and doing nothing next year, chucking something over there next year and doing nothing the following year; but I disagree with the chairman, and I believe the force of your action will depend upon how broad your policy will be. The force of your action is not going to be judged by the smallness of the sum contemplated by the bill. The figures in dollars and cents that you are going to expend for the locality will only detract from your work if together with it there is not in contemplation to do for other communities what you propose immediately to do for the lower Mississippi Valley, and it is the understanding of the broader proposition that will bring to your support, as I believe there is plenty of

sentiment in the country for it, not only the newspaper world of the United States, but the business and the popular world of the United States.

Senator NEWLANDS. In order to sustain your argument on that point, I wish to mention the fact that shortly before I came on to Congress I received a telegram from the governor of Kansas saying they had had destructive floods in that State; that they had had a waterway conference from all parts of the State there; that the bill, which bears your name and mine, the so-called Newlands-Broussard bill, had been up for consideration; that they were pleased with it, and they asked me to come to Topeka on my way to Washington and confer with them. I replied that I would.

Members attended the conference from all parts of the State, and the conference was composed of a hundred or more of the most prominent men in the State, both in public life and all the various vocations. They are familiar with this bill; they have studied it and have had it examined by a committee, etc., and they unanimously passed a resolution supporting this bill. I asked the governor of the State whether they relied upon the delegation of that State to support the bill, and he said they felt sure they could. And I know the Senators from that State have expressed the greatest interest in the bill and have inquired about it of me several times. That is a bill calling for \$60,000,000 annually for 10 years, \$600,000,000, and they did not blink at it.

Senator BROUSSARD. Mr. Cafferty is here.

The CHAIRMAN. Before you introduce him, I wish to say that we are very much interested in what you have said. I do not think the committee has any thought of reporting the bill without making a provision for investigating other people's troubles. They had not so thought, at any rate I know, a week ago, and do not unless they have changed their minds in the last few days. They certainly intended to provide some sort of machinery by which all these matters could be investigated and a serious effort made to coordinate the various uses that were related to the subject. However, it is a very difficult matter to determine just where to lodge that authority. I have asked nearly all the gentlemen here about that with a view to getting their ideas as to just where to place that authority, and that has been the purpose of my inquiry to-day. Your bill provides for a commission and to turn over to that commission a lump sum with no directions as to what to do with it, the first authorization being for \$600,000,000. Now, we have had nobody here yet who has been able to give us any sort of idea whether \$600,000,000 is enough or not. Some day it may grow into billions, but that, they think, does not make any difference. Perhaps your experience here in Congress would not give you that optimism that it does not make any difference whether it grows into billions or not when you are asking Congress to appropriate.

Senator BROUSSARD. You have to be specific; I understand that.

Senator NEWLANDS. Not very specific. When they concluded to go into the Panama Canal it was on the assumption that it would cost \$150,000,000 and, although there was warning that it would cost more, that it would possibly cost \$450,000,000, yet they did not hesitate to do it.

The CHAIRMAN. We wanted the Panama Canal. I know myself I voted for a lock canal on the argument that it could be built for \$140,000,000.

Senator BROUSSARD. So did I.

The CHAIRMAN. Whereas a sea-level canal would cost \$300,000,000, but Congress itself subsequently very radically changed the plans of Panama. You can not lay that on the engineers. We changed that.

I have made that preliminary statement, Senator, to show that we are not in such hostility to this general investigation as some people seem to think we are.

Senator BROUSSARD. I do not think you are.

The CHAIRMAN. Do you think we ought to appoint the Cabinet officers and give them the authority to do this, or do you think we ought to appoint another commission?

Senator BROUSSARD. I think the Cabinet officers would be preferable. I have given considerable thought to the idea. I can not in my own mind shape any commission that would meet the requirements or the needs of this work better than the men who are appointed from time to time to supervise sections of that work. Of course, if we select a commission, or if the President selects a commission from civil life, some men on that commission would have to know something about levees; some men on that commission would have to have some knowledge of revetments; some men would have to have some knowledge of reservoirs; some men would have to have some knowledge of water power; and all of these questions I doubt very much, outside of the service itself in the various branches of the Government that deal with these subjects, that you could get better men than the men who are actually at work on these various matters.

I do not believe, for instance, that you could get a better man to look after the lower river from out of the Mississippi River Commission than you can from off the Mississippi River Commission. I believe the man who has been on the commission would know more about it, particularly if he is a civilian, than a man who has given a study to it in a theoretical way, because a man on the commission like Mr. Taylor, for instance, has given both theoretical study to it and has looked at the practical end of it. I would not want to disturb by that plan, however, these branches of the service that naturally would be included in the scope of a nation-wide treatment of this proposition, the various organizations already in existence. I would not want to supplant the Mississippi River Commission as to the lower river; I would not want to supplant any other branch that may be treating other portions of this work. But I think the primary commission you should have is a commission to exercise and pass judgment, a commission of laymen to whom the layman could go and talk to about his method of solving one problem here and another problem there; for instance, that Mr. Parker could go before a commission of civilian men who are big enough to occupy Cabinet positions and talk about spillways and get a better hearing than from a man who has studied the river and would not want to center his mind on a thing already concluded, having already concluded that a levee or a revetment at dangerous curves of the river would solve the problem without the use of a spillway.

The CHAIRMAN. Would you give this civilian commission then the power upon presentation by another layman, like Mr. Parker, of an engineering proposition, power to overweigh—

Senator BROUSSARD. No; I would not. But I would give it the same power that the Secretary of the Navy has over the board that attends to the affairs of the United States Navy. I would give it that general supervision; I would give it the same power that the Panama Canal Commission had over the engineer commission that went down there and failed to build the canal, and the same power which it subsequently exercised over Col. Goethals, when he went there and completed the canal. I would give it the same power that the Secretary of War has to-day over the government of the Philippine Islands; I would give it the same power that the Secretary of War has over the government of Porto Rico; the same power that Mr. Lane has over conditions up in Alaska.

Why, all of our government, every function of our government, operates just along the lines of these suggestions which I made for a civilian commission. What I say led Senator Newlands and myself to include in this bill provision for a civilian commission to supervise in a certain way, in a certain manner, the work of scientific men who are solving the scientific propositions involved.

The CHAIRMAN. Let me ask you one other thing, Senator. Would you have these investigations made and report to Congress, and then ask Congress to report on that, then just turn a lump sum over to the commission?

Senator BROUSSARD. No, sir; I would not turn a lump sum over to the commission. I am not in favor of any legislation that takes any lump sum out of the Treasury and turns it over to civilians or scientific men. To illustrate this thing, for instance, I have always favored and have voted for a tariff commission. But as to the question of making a law to raise revenues, a congressional function, I want that commission to report to Congress, and Congress can then exercise its functions of saying—the laymen's supervision, the general, final supervision over everybody—of saying whether that money should be raised or not. There must be given advice before money shall be taken out of the Treasury to be expended in regard to any functions of government. In other words, the same jurisdiction, Mr. Chairman, that the Army, the Navy, and every other branch of Government exercises. The Army, through its officers, through the General Staff, makes suggestions to Congress as to what money they need to operate the Army, and that goes to the Secretary of War, and the Secretary of War revises the estimates, although he is not a military man, and that comes to Congress, and Congress, consisting of scarcely any men with a practical knowledge of military matters, finally refers it to a committee, and this committee brings it back and in the final solution we take care of the Army. I would do the same thing with this proposition.

The CHAIRMAN. Suppose that we should put a provision in here by which any watersheds in the country might be examined, that Congress would order that this particular watershed be examined, and that upon investigation they would take into consideration the water power uses, and any other beneficial uses that the water could be put to, and how these various uses could be coordinated so as to control the floods and not to injure navigation, but rather to help it,

if possible, to develop water power, and do all those things, and then have that report brought back to Congress before there was any action on it. What would you say to that?

Senator BROUSSARD. I think that would be all right.

The CHAIRMAN. The question then, of course, would be one which occurs to me to be of very small and very unimportant detail, as to just who should make that investigation.

Senator BROUSSARD. I am going to say this is all right; it is a step in the right direction, but unless you coordinate all of this work under some given head, so that each may know what the other is doing, that the water-power man who has gone up there to calculate the horsepower that is being wasted now, so that an engineer in Pennsylvania may know what the levee man down in New Orleans is doing, and what the revetment man is doing, and what the reclamation man is doing over in another section, and what the forestry man is doing in aid of the solution of this problem, unless you have one head you can not accomplish anything. And I favor a civilian head for that, not a scientific head. It will not impair the usefulness of the Mississippi River Commission in doing what it ought to do.

The CHAIRMAN. We are talking now about the general proposition aside from the Mississippi River Commission.

Senator BROUSSARD. Yes, sir.

The CHAIRMAN. Whenever we investigate any watershed, I do not think it is in the contemplation of this committee to confine its activities to the Mississippi River.

Senator BROUSSARD. I hope not.

The CHAIRMAN. That has not been in their contemplation up to now. I will say that. Whenever we investigate any watershed, whenever we undertake control of the floods in any part of the country, if we go to Wilkes-Barre, where I visited yesterday, to investigate that matter, that investigation would contemplate and include the investigation of the watershed, the study of the water-power possibilities, if any there, and any and all the beneficial uses that are related to flood control, report to Congress any plan by which they could all be coordinated. That would meet with your approval, would it not?

Senator BROUSSARD. That would meet with my approval.

The CHAIRMAN. The next question would be as to who should do that, who should compose the commission. That would be a matter, it occurs to me, of very minor detail.

Senator BROUSSARD. Yes. I think this committee could find a way to put that thought into effect, and if the committee then recommended an appropriation sufficient to do that work so this commission might go to work at once with such agencies as are now at hand, and where there was not such agencies to organize agencies to make this investigation, I believe that we would be on a fair way to solve the problem.

The CHAIRMAN. Speaking of making the appropriation. Here would be some particular watershed that we undertook to investigate. We would want to have some idea—Congress would want to have some idea—of what that was going to cost before it was undertaken. That could be roughly ascertained at an expenditure of a very small amount of money. We take a man qualified to make such an investigation, to make what we call a preliminary investigation

and report to Congress, in order to make a thorough investigation of that watershed for all the purposes that are contemplated by Congress, it would require so much money. Do you not think that would be the better way to do it, to let Congress then take up the matter and say whether or not Congress was willing to expend that much money in that investigation when the facts were all presented?

Senator BROUSSARD. Mr. Chairman, let me suggest this: The chairman has served for a long time and been a very valuable member on the Rivers and Harbors Committee. I know that, and speak from experience, of his knowledge of the work of that committee and the effective work and the efficient work he has done on that committee. Now, did not that committee long ago find out that they could trust the engineer's office to make surveys of streams by saying, "Here is \$300,000, Mr. Chief of Engineers; now, have a preliminary survey made of such and such streams," just naming the streams?

The CHAIRMAN. Yes.

Senator BROUSSARD. Did it not work? As a matter of fact, the old way of doing it, by which we would survey Snake River, for example, putting \$10,000 in the hands of the engineers, it did not work nearly so well as taking a lump sum of money and giving it to the Chief of Engineers?

The CHAIRMAN. No.

Senator BROUSSARD. That was the experience we had in our own service here?

The CHAIRMAN. Yes.

Senator BROUSSARD. Now, would it not be, if we discussed the question, or this committee got the various departments whose men are going to be employed, to say, "Now, Mr. Lane," or whoever is in the branch of service that you intend to utilize in this work, "we are going to do certain work. Now, will you figure out just about what it will cost for you to do that?" And then the Mississippi River Commission figures that out, and all the engineers figure that out; then the Forestry Division figure out another angle of this thing; and then when you put those together, give a lump sum of money to this commission and tell them to go ahead and make these surveys as in their judgment the importance of each may appear.

My theory is this—and that is why I am advocating a lump-sum appropriation for the investigational matter—my theory is that clearly there is a way of doing that whole work that is better than any other way, and I do not know a man in the world who could tell me which is the best way to do it. I know that every man interested in the subject wants it done in the best way. In other words, it ought to be done so that every horsepower that can be utilized would be utilized. It ought to be done so that every dam that is placed in a stream is put exactly where it can impound the most water and do it the most easily when the floods are up, and release it the most easily when the river is down. It ought to be, whatever reservoir is made, whether that reservoir is made for the purpose of irrigating arid land in the West, of holding these waters, so that when the crop is growing they can utilize that water in irrigating those lands, or whether the water is impounded with a view to aiding the fish production of the country—those matters are the things, that is the one thing that ought to be kept in mind always, that in solving this proposition the people of this country should get, and generations to

come should get, the highest efficiency out of that work; the great result in helping the arid lands to produce the most quantity of foodstuffs, and the watersheds that can not be reclaimed, or the holes that can not be reclaimed, to be used for producing the most fish supply for the people; the streams that are not now navigated that can be made navigable by a scientific treatment of a river—all of these things ought to be done in the best way, and no one, until he knows the whole subject and has scientific knowledge of all these questions, can say what is the best way. If we take it piecemeal and treat a section of the river here and another section over there, the wastage that will result from that sort of an expenditure of money to future generations as to the use of this water will appall those who come after us and look at the absurd way in which we have treated the matter. That is my view of this subject.

I will say to the chairman that I have devoted a great deal of thought to it because of the immensity of the proposition, and it may be that the immensity of it is what has attracted my mind to the study of it. Not the fear that the people of the country would not stand for that broad proposition, but the belief that once properly presented to the people of the country it would appeal to everyone as the proper use of the water of the United States for the benefit of the people of the United States.

So I think that the better way would be to appropriate a sum of money and give it to this board—this central board—to create subsidiary boards to handle the various branches of this proposition under the control of this central board, and to make the surveys—place the authority for the surveys in the hands of this central board, that it might utilize branches of Government already established that can give us the best results in the investigation of the various scientific questions involved; then this central board to be made to report.

When that work is undertaken I think that this committee should be given the rank of a committee with authority to appropriate money, to include an appropriation; and I believe that the Senate of the United States will then have to create a committee with similar power, so that this committee may handle the proposition separately and apart from the harbors of the country. I think that that will all develop as we go along. But if we plan a proposition of that character, I think it will lend weight in and out of Congress, and I think there will be less difficulty in securing favorable action at this Congress than for any isolated proposition, no matter how meritorious it may be.

The CHAIRMAN. Just one other thought, Senator: The chairman, however, does not think this committee ought to have power to appropriate money.

Senator BROUSSARD. The time will come. This is the biggest proposition Congress has ever handled. It will have to be handled in that way.

The CHAIRMAN. I just want to call attention to the fact that the Mississippi River Commission has not been as limited in its jurisdiction and its investigation as seems to be thought. The Mississippi River Commission has had pretty ample authority in making the investigations of the Mississippi, of the questions which have been suggested here, and has made them, and has taken into consideration

these matters in reaching its conclusions; and to show you I should like to read here a section of the authority upon which the Mississippi River Commission has proceeded.

Senator BROUSSARD. If you will permit me, I will say that I am not so much concerned about the authority as the fact whether they have done it or not. We have never given them a dollar to do it.

The CHAIRMAN. Yes; money has been appropriated for it, and they have made the study. The section I wish to read is as follows:

It shall be the duty of the said commission to direct and complete such surveys of said river between the Head of the Passes near its mouth to its headwaters as may now be in progress, and to make such additional surveys, examinations, and investigations—topographical, hydrographical, and hydrometrical—of said river and its tributaries as may be deemed necessary by said commission to carry out the objects of this act.

Senator BROUSSARD. That is very broad authority.

The CHAIRMAN. In the investigation of all the subjects the Mississippi River Commission finally arrived at its conclusion. Now, whether erroneous or not, of course, is a matter about which we are bound to differ, but at any rate they made this very broad investigation and have reported.

I want to put this statement in. My own opinion is, if I could write the law into the book, that whenever an investigation is ordered and examination ordered of any watershed covering any flood problem, that the engineers should be instructed to make an examination of the watershed. That in that investigation they should take into consideration the possible development of water power, and every other beneficial or related use that water could be put to, not only for the purpose of flood control, but of navigation and whatever else, and should include all of that in their report to Congress. That is what I should like to see done, and if that is done, if the machinery is created whereby that can be done, even if it does not happen to be the particular kind of machinery that each member would prefer, I can not see how any man could object to a bill on the ground it was not broad enough. Of course that would provide for the examination upon every watershed in the United States that ought to be investigated in the judgment of Congress, and a report on every phase of the water problem contained in that watershed.

Senator BROUSSARD. As a matter of fact, they have not done that, and Congress has never been willing, and Congress would not be willing to give them money to do that. Congress would never vote the money for the Mississippi River Commission to do the work which has just been done above Pittsburgh.

The CHAIRMAN. I do not seem to make myself clear. I say if I had to write the law upon a book, that is what I would do.

Senator BROUSSARD. I understood the chairman, after reading the power of the commission, to say they had power to do that, but they have never done it. But, more than that, let me just refer to a change made as to one instance. The question of the divorcement of the Mississippi from the Atchafalaya River was pending here at the time the Mississippi River Commission was created. There was no question that the commission had the authority to investigate the matter of whether the Atchafalaya should or should not be divorced under this authority which the chairman quoted, but the chairman knows that from 1879 to 1910 the commission did not do anything

with regard to investigating that important proposition toward the solution of the Mississippi River problem; that the commission did not do it, despite the fact that to my certain knowledge it never went to Louisiana without having a committee call on it, and a hearing given, petitioning them to make that investigation. Year in and year out that commission did not come down the river that Capt. King, or somebody else in the Atchafalaya country, was not there asking, begging, and praying the commission to investigate the matter. Yet it never did it until 1910. The chairman will remember I had a resolution; he will remember because I called on him, and he was kind enough to help me; and I believe Senator Ransdall was on that committee at that time. He secured, I believe, the insertion in the rivers and harbors bill that year for that investigation, the direction of that investigation by the commission, but it was not until 1914—from 1879 until 1914—and then only after Congress had directed them to do that; the commission never even looked into the question as to whether or not the Atchafalaya River should or should not be a part of the Mississippi levee system.

That is not said in criticism of the commission at all. The commission has taken the position that there were two restrictions placed upon the general power given it under the law. One was the physical restriction of lack of funds to do it with, and Congress would not give them the money. The other was that Congress passed a law that no engineer should poke his nose into any investigation unless directed by Congress, and that these two things presented an insurmountable obstacle in the way of that commission acting. So when I make the statement that the commission did not do that, one must always keep in mind that it had two restrictions that were absolutely antagonistic to the powers the laws granted it.

So it is with the spillway proposition. They have not felt, I imagine, that they could act unless your committee would tell them to go ahead and investigate the matter. It seems, however, they have had an investigation, made through Col. or Maj. Sherrill.

The CHAIRMAN. There is no restriction upon their power.

Senator BROUSSARD. They have the power, but had not the power—

The CHAIRMAN (interposing). We have not given them the power to go to the Atchafalaya and build any levees down there. We have not done that.

Senator BROUSSARD. My point was not they had not done anything toward building levees, but my point was they had the power under this provision to say, when the people of the Atchafalaya Basin asked them, whether the river could not be divorced so they could be spared an overflow every year; that from 1879 up to 1910 they would not even investigate the matter, saying, on the one hand, that they had no money, and, on the other hand, that this might be construed by Congress to be a different proposition; that their authority extended over the Mississippi River, and the Atchafalaya was treated on the maps and treated by the people in discoursing about it as a separate stream entirely from the Mississippi River, and that perhaps their jurisdiction did not extend there. And then there was a general law on the statute books which forbade them to do that sort of thing anyhow unless specifically directed by Congress; and

what, with one and another excuse, here was a great stream, as big as the Mississippi River itself, lying right adjacent and abutting into the Mississippi River, that they did not investigate. They did not investigate with a view of ascertaining whether it was more useful to be permitted to go uncontrolled or whether some control ought to be had on it, and they did not do it until Congress directed them specifically to do it, and then so much work was to be done with it that it took them over four years to report to Congress their conclusions on it.

Now, if they did not do that with regard to that main branch of the river, an outlet even larger than the Mississippi River outlet itself, than any single outlet of the Mississippi, because the Atchafalaya spills itself into the Gulf in one stream, while the Mississippi River diverts its water into three streams—a larger outlet than the Mississippi River outlet itself. They have not studied—although you would think under this general authority they would go up to Pittsburgh and study the situation there in order to control the floods; that under their general authority of jurisdiction from Cairo to the Gulf that they would go up into the Ohio, would go up into Pennsylvania, or go into some other State and study the problem and its effect upon the Ohio River.

(Thereupon, at 5 o'clock p. m., the committee adjourned until Tuesday, April 4, 1916, at 10 o'clock a. m.)

COMMITTEE ON FLOOD CONTROL,
HOUSE OF REPRESENTATIVES,
Tuesday, April 4, 1916.

The committee met at 10.10 a. m., Hon. Benjamin G. Humphreys (chairman) presiding.

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STATEMENT OF MR. DONELSON CAFFERY, ATTORNEY, OF NEW ORLEANS, LA.

Mr. CAFFERY. I have been very much impressed, gentlemen, with the earnestness with which you have undertaken the solution or remedying of flood conditions on the Mississippi River and with the practicalness of the questions that you have asked and with the patience with which this committee has listened to the long hearings before it. I want to thank the committee, too, for giving us this opportunity at this late date to be heard and to put before it certain conditions interesting to us in Louisiana.

I appear before you, not representing any particular interest in Louisiana, not as an advocate of any pet theory, but merely for the purpose of putting before you such of the conditions as possibly have not been presented to you from our local viewpoint.

By that, however, I do not mean to say that we do not realize the largeness of the problem with which you are grappling and that we have no views upon the larger aspects of this problem. The immediate question which concerns us is the treatment of the Atchafalaya River. The Atchafalaya is one of the mouths, you might say, of the Mississippi River. It has been referred to as an outlet of the

Mississippi River and by some authorities as a sort of bastard outlet of the Mississippi River, an outlet which should be closed, but which nevertheless has not been closed. It is now used, and has been used since 1850 or 1860, as an outlet which carried off fully one-quarter and possibly one-third of the flood volume of the Mississippi River. It has been stated that there are 2,000,000 acres of land subject to overflow by the flood waters in the Atchafalaya and Red River basins. That is no inconsiderable proportion of the area affected by the levee system of the Mississippi River. As I understand, the figures are that there is a total area of about 16,000,000 acres protected by the Mississippi levees, so that the Atchafalaya problem is not the least of the problems of flood control on the Mississippi River.

The immediate aspect of the problem is that the flood waters of the Mississippi River are discharged down the Atchafalaya basin, and that no provision whatever is made for protecting the riparian properties on the Atchafalaya. Inasmuch as the Atchafalaya is a branch of the Mississippi River, the equities of the case undoubtedly require that the Atchafalaya landowners be treated in the same way as other landowners on the Mississippi River. The equities of the case are further increased and heightened by the consideration that the levee system elsewhere on the Mississippi River brings an increased height of flood to the Atchafalaya. It seems to be settled and undisputed that the effect of the levee system on the Mississippi River has been to raise the flood level at least 5 feet all the way from Cairo to Red River Landing. That increased height is acutely felt by the 2,000,000 acres of Atchafalaya land. So acutely is it felt that once prosperous farmers and once immense plantations are now given over to frogs and weeds as a result of the coming of the increased waters.

The Mississippi River Commission, of course, has practical charge of this immediate question. The Mississippi River Commission has never taken the Atchafalaya within the scope of its operations. We think that is an injustice to the people of the Atchafalaya country. We think it is a gross injustice, and we come to protest before this committee to the further continuance of that treatment of the Atchafalaya.

There have been two ways suggested of dealing with the Atchafalaya condition: One is that the Atchafalaya be divorced from the Mississippi River, and the other is that the Atchafalaya land be treated in the same way as Mississippi River land. The divorcement of the Atchafalaya from the Mississippi River would undoubtedly solve the problem equitably, in so far as least as the Atchafalaya people are concerned. The Atchafalaya could take care of its own water. It could probably take care of the Red River water. It could probably do that without any trouble. The general conditions appear to be that the Atchafalaya country or the Atchafalaya basin was once the mouth of the Mississippi River, possibly the sole mouth of the Mississippi River, just as general conditions would indicate that on the other side of what is now the bed of the Mississippi River, Lake Maurepas and Lake Borgne and Lake Ponchartrain were also mouths of the Mississippi River. The Atchafalaya strikes far up into the north from the Gulf, just as Maurepas and Borgne do on the other side of the Mississippi River. Both strike far up into the north from the Gulf to indicate that there has been at one time at

least an immense fluvial operation, I suppose you might say, in those two sections, and that the Mississippi River having once possibly occupied its bed in the Atchafalaya district, and having once possibly been over on the Maurepas side, has now, by its unstableness of bed, finally chosen its route about midway between the Maurepas, Lake Borgne, and Lake Ponchartrain section on the one side and the Atchafalaya section on the other side. Therefore, with the Atchafalaya having once been the bed of the Mississippi River, and being now actually and possibly necessarily a part of the Mississippi system, it would seem that if there is to be an equitable treatment of the problem the Atchafalaya country should come under the jurisdiction of the Mississippi River Commission in the same way as the Mississippi River country. If you choose to solve the problem by divorcing the Atchafalaya from the Mississippi River, the Mississippi River Commission tells you that you throw upon the Mississippi River levees below Red River Landing a strain which at present they can not stand. It is estimated by the commission that the increased flood height below Red River Landing in consequence of the throwing of the waters of the Mississippi River down below Red River Landing and the failure to utilize the Atchafalaya would cause a rise in the flood level of at least 4 feet. As the Atchafalaya is rendering this service to the Mississippi River, rendering this service to the entire valley, rendering this service of carrying this burden, there should be some recognition of the equities of the Atchafalaya people and country. During all these years there has been no recognition whatever of those equities.

The CHAIRMAN. Do you understand that the recognition, or rather the failure of recognition, has been the fault of Congress and not of the commission? The commission has no power under the law to take care of the Atchafalaya River. The fault lies with Congress, and not with the Mississippi River Commission.

Mr. CAFFERY. While I realize what the difficulties of the Mississippi River Commission have been, and while I realize how much hampered it has been by what I may say has been the niggardliness of Congress, yet I can not say that all the fault has been with Congress. The Mississippi River Commission has never made any genuine attempt to interest Congress in this problem. The Mississippi River Commission has never adopted any settled policy with regard to the Atchafalaya country; it has never made any recommendations to Congress concerning the Atchafalaya country; and it was, at least, the duty of the Mississippi River Commission, knowing the conditions of the Atchafalaya country, to give it some recognition and to do what it could in an engineering way.

Mr. HUSTED. Why was it the duty, in your opinion, of the Mississippi River Commission to ask Congress for jurisdiction?

Mr. CAFFERY. Because the Atchafalaya is a part of the Mississippi River, with the care of which the Mississippi River Commission is charged. The Mississippi River Commission could not simply take a part of the Mississippi River and ignore entirely existing conditions on another part. That is what it has been doing.

The CHAIRMAN. It was confined by law in its activities to the Mississippi River.

Mr. CAFFERY. This is the Mississippi River.

The CHAIRMAN. Whatever it may be physically, in name it is the Atchafalaya. Of course, Congress named the river that the Mississippi River Commission was to treat and said the Mississippi River. It did not say the Atchafalaya. Congress passed a law which forbids the engineers to report upon any matter they have not been requested to report upon by Congress in a special act or resolution, so that the Mississippi River Commission could not report on the conditions on the lower Atchafalaya without being specifically directed by Congress to make that report. Therefore I think the criticism, while it may be entirely just, should be directed at Congress and not at the executive officers.

Mr. CAFFERY. Mr. Chairman, I feel that a great board charged with the duty of supervising a great work should not ignore one of the necessary and equitable features of that work; and that such a board would do its duty, and does do its duty, lamely and incompetently when it closes its eyes to a situation so large and imperative as the Atchafalaya situation.

The CHAIRMAN. But Congress closed the commission's eyes, Mr. Caffery. By positive act the Congress has said that the engineers shall not report upon any project unless they have been specifically authorized and directed to do so by act of Congress.

Mr. CAFFERY. That was true as to particular projects, but this is not a particular project. This is bone of the bone and flesh of the flesh of the Mississippi River, and of the work on the Mississippi River by the Mississippi River Commission; and there is not any reason why a mere ban of that kind on the part of Congress should have held the hands of the Mississippi River Commission in so far as a vital and necessary part of its work was concerned.

Mr. HUSTED. Has the Mississippi River Commission, in the execution of its duties, done anything which has made conditions worse in the Atchafalaya country?

Mr. CAFFERY. Well, there are two things. One it has done and the other it has not done. One it has done by raising the flood level 4 feet and throwing 4 feet more of water on the people in the Atchafalaya country. What it has not done has been not to close the Atchafalaya River.

The CHAIRMAN. You think that ought to be done?

Mr. CAFFERY. That is a part of the question of outlets, Mr. Chairman. I have some views on that question which I would not be unwilling to put before the committee.

The CHAIRMAN. This specific question has been discussed for the last several days. You are not an engineer; you are an attorney; is not that true?

Mr. CAFFERY. That is very true.

The CHAIRMAN. I did not mean that as a reflection at all. Other gentlemen who are not engineers have been giving their opinions, and we would like to have your opinion as to whether or not there should be a divorcement between the Mississippi River and the Atchafalaya River.

Mr. HUSTED. Do you not think it would be a good plan for each witness who makes a statement before the committee to preface his statement by stating his qualifications?

The CHAIRMAN. That would be a good idea.

Mr. HUSTED. That has not been done in the case of some witnesses. For example, I do not think it was done in the case of Mr. Maxwell.

The CHAIRMAN. He stated that he was not an engineer, but an attorney.

Mr. CAFFERY. I am not an engineer. I have practiced law for 25 years. All that would save me from presumption, I might say, would be a consideration of the fact that I have lived in the Mississippi Valley for 45 years, and that I am familiar with the physical conditions there, and that I have taken some interest in flood conditions all my life. In other words, I know something of the non-professional side of the question. From an engineering standpoint, I know nothing at all. I make no pretension whatever in that direction, but the Mississippi River problem, it seems to me, is not only an engineering problem, but it is a problem requiring the exercise of logical faculties. It is a problem requiring the drawing of conclusions from ascertained data, and as to the drawing of those conclusions from ascertained data, I do not know that the Mississippi River Commission is any more competent than anybody else. The Mississippi River Commission is undoubtedly more competent than the ordinary citizen is to accumulate this data, but the data concerning the Mississippi River control is, when accumulated, so large in its aspect that it becomes something like that at the Panama Canal, or something like that at the jetties, concerning which the opinions of engineers seem to have been sadly mistaken.

I need not remind the committee how mistaken the consulting engineers were with regard to the building of a sea-level canal at Panama; and I need not remind the committee how mistaken they were with regard to the building of the jetties on the lower Mississippi River. As to the divorcement, gentlemen, of the Atchafalaya and the Mississippi Rivers, the data, which I have encountered, has been given by the Mississippi River Commission. That data, in a large way, is this: That the flood level at Memphis was 34 feet in 1862. That was the highest recorded. It seems that the river measurements went back to 1828. The flood level in Memphis in 1862 was the highest-recorded level. It was considered unprecedented. In 1912 the flood level was 44 feet and more. The highest recorded-flood level at New Orleans was 16 feet for a good many years. Later the flood level climbed up to 22 feet. In other words, there has been a rise of the flood level of the Mississippi River of from 6 to 10 feet all along its course.

Now, at Red River Landing the Mississippi River Commission adduced statistics to show that there has been a rise in the flood level there. That it does is proof of its proposition that, because there is an outlet at the Red River Landing into the Atchafalaya, that outlet has caused the rise in the flood level at Red River Landing. The extent of that rise in the flood level at the Red River Landing is, in fact, totally swallowed up in the larger fact that there has been a rise in the flood level of the Mississippi River all the way from Cairo to the Gulf, and that it is indubitable that the rise in the Mississippi River at Memphis and from Memphis to Red River Landing has not been due to outlets because there have been no outlets there except in the crevasses. It would seem to me that with the rise in the flood level, which is admittedly due and necessarily due to the construction of the levees, it would be an utter impossibility to close

the Atchafalaya River, because you would have an additional rise on account of the Mississippi River content of at least 4 feet below Red River Landing.

I say, "utterly impossible." That is, of course, rather a broad statement. It would not be utterly impossible if you build a levee 5 or 10 feet higher—5 feet would not leave a sufficient margin of safety. If you make the levee high enough and if you make the bases strong enough and solid enough you can solve all these problems by the "levee only" theory.

The CHAIRMAN. By whom is that advocated?

Mr. CAFFERY. By the Mississippi River Commission.

The CHAIRMAN. They have never advocated it before the committee. They have said that the levees must be supplemented by revetment.

Mr. CAFFERY. Revetment is only incidental to the levees.

The CHAIRMAN. It is incidental, but it is a very important work.

Mr. CAFFERY. Oh, undoubtedly.

The CHAIRMAN. I would hardly think there would be any justification for calling revetments mere incidental work.

Mr. CAFFERY. It is entirely subsidiary to the levee. It is not subsidiary to the outlet theory; it is not subsidiary to the spillway theory; it is subsidiary to no other theory than the levee theory.

The CHAIRMAN. Well, it is all right. I do not care to go into that.

Mr. CAFFERY. Therefore, as to the closing of the Atchafalaya, Mr. Chairman, it would seem to me to be rather a rash undertaking.

The CHAIRMAN. In your opinion, it would not be a wise thing to do?

Mr. CAFFERY. In my opinion, it would be a very dangerous thing to do as things stand. I doubt whether it would be a reasonable thing to do for the reason that if you get the levee up to a height of 5 feet, you would always have that other problem which you have referred to in speaking of revetment—that other problem of the safety of the bases of these levees. Not only must these levees be strong enough and high enough, but they must be of sufficient solidity so as not to be undermined by the river, as has been done in the case of the most disastrous crevasses. Take the Hymelia crevasse, for instance, which did so much devastation in 1912, and the Salem crevasse, which did so much harm in northern Louisiana. They were not due to the inadequacy of the levees, but to the treachery of the foundations. That, it seems, is something that diligence can hardly guard against. It has not been advocated that we shall have a concrete foundation for the levees all the way down to the mouth of the river. Therefore, you have always the danger, and generally the fact, of a crevasse in the levees due to weakness of the foundations. So that as strong and high as the levees may be and as dogmatic as the Mississippi River Commission may be about solving the levee problems, and possibly as necessary as it is to solve it in that way, you will always be faced with the danger, and with more than the possibility of a crevasse, due to weakness of the foundation.

Mr. HUSTED. Would it be possible for a crevasse on the Atchafalaya to damage the city of New Orleans?

Mr. CAFFERY. No, sir; that would be utterly impossible.

Mr. HUSTED. It would be impossible?

Mr. CAFFERY. Utterly so.

The CHAIRMAN. Do you know what it would cost to protect the Atchafalaya by the levee system?

Mr. CAFFERY. As the general figures indicate that the Mississippi River levee system has cost \$100,000,000, and that has protected 15,000,000 acres, it would seem as if an expenditure of \$10 an acre would be ample for levee purposes under all ordinary conditions. If there are 2,000,000 acres of land in the Atchafalaya River district, \$20,000,000 would be ample, but the Atchafalaya conditions are not ordinary conditions.

The CHAIRMAN. I hardly think you could adopt that as a basis of calculation, because we have reports from the Mississippi River Commission to the effect that lands from Vicksburg south on the east bank of the river would have to be valued at \$100 or \$200 an acre, and if you proceeded on your theory or basis you can readily see what the result would be. I should say that the correct estimate of the cost would rather be the length of the levee and the yardage required.

Mr. CAFFERY. As to that detail, of course, I could not give you any information. I doubt whether that information could be given even by an engineer, because of the peculiar character of the Atchafalaya country, which is cut up by swamps and streams and bays.

The CHAIRMAN. Still, your thought is that it can be protected by levees, or would you have it done in some other way?

Mr. CAFFERY. There is no other way to protect it than by levees or by divorcing the Mississippi River from the Atchafalaya.

The CHAIRMAN. Congress has never ordered, and therefore the commission has never had the right, to make that examination in order that it might advise Congress how much it would cost to protect the Atchafalaya by means other than divorcement from the Mississippi River. Would it be your idea that this committee should include a provision, in whatever bill it may report, authorizing and directing the Mississippi River Commission to make that examination, so that you would know then how much it would cost?

Mr. CAFFERY. Mr. Chairman, as to that I would suggest various specific plans.

The CHAIRMAN. We will be glad to hear any suggestions you have to make.

Mr. CAFFERY. In the first place, I think there is too much inaccessibility to the data concerning the river problem. I think that the river problem is one which the lay mind can throw as much light on as, possibly, the engineering mind, after the engineering hand and skill have accumulated the necessary data. I think that there might well be a compendium of all data on Mississippi River conditions than now is scattered in the reports of the Mississippi River Commission and in the books of Humphreys and Abbot, Ellet, and various authorities on this problem. This question is one of magnitude, and one that is pressing, but it is also one about which little has been done, notwithstanding such investigations as you gentlemen are making, and notwithstanding other investigations which have already been made. I think that Senator Burrows, when he was in the House, was at the head of just such a committee as you now have.

The CHAIRMAN. That was an official committee appointed by Congress to go down the river and make a report.

Mr. CAFFERY. Yes; a report on the conditions.

The CHAIRMAN. Yes; but it had no legislative authority.

Mr. CAFFERY. None at all, but they were dealing with the same general situation. I remember that the question of outlets was before that committee. It was suggested in the report of the committee that while outlets might be beneficial, the commission was not prepared to say that they should be ordered. So that, as this question is one which has been before Congress for a long time, and one in connection with which the data is scattered, that compendium, I think, would be of extraordinary value. If you gentlemen could have some able and accomplished editor set to work on Mississippi River data we could have on hand such a work as would throw great light upon the questions involved here. You might go further than that, it seems to me. We look from the Mississippi River to other rivers. We look to the rivers in China, and it seems to me there should be a bureau of information, such as there is in the Department of Agriculture, which disseminates information as to how and when to plant potatoes, alfalfa, and so on. Such a bureau of information could give us the happenings on the Mississippi River, on the Po, on the Rhine, and on the Danube, and keep us posted about up-to-date improvements, and tell us what is going on on the Nile. It seems to me, as I remember it, that there is a statement that the Nile has raised about 7 feet. We should know why that is so if that is true.

It is stated that on some of the rivers in China there are double lines of levees.

The CHAIRMAN. Is it your thought that before we undertake to do anything for the relief of the Atchafalaya we should first make these investigations that you now suggest?

Mr. CAFFERY. What I am now speaking of is rather general, but as to the relief of the Atchafalaya, I would suggest that the Mississippi River Commission be given \$5,000,000 for doing such immediate and necessary levee work as it judges should be done. We know, of course, that it would cost a great deal more than that. Anyone who is at all familiar with the Atchafalaya River conditions will know that \$5,000,000 will not do the work, but \$5,000,000 can very properly be spent in the Atchafalaya Basin. Therefore I would say that the Mississippi River Commission should be given immediately \$5,000,000 for levee work on the Atchafalaya River.

The CHAIRMAN. Let me suggest this to you: While this committee would be very glad to do that, we have to put this bill through the House before it can become a law. You can see at once the trouble we would encounter if we should go to the House and say we are going now to build levees on the Atchafalaya and are prepared to spend \$5,000,000 on that work. Then the question would immediately arise, How much is it going to cost to complete that work? You can see right there the trouble that we would encounter. Don't you think it would be better, with that almost certain fate staring us in the face, if we proceeded along those lines, to have the Mississippi River Commission make an examination and report as soon as it can, telling us just what levee lines will be necessary, and how much it will cost, and how much land is going to be protected by these levee lines if constructed, so that we can then, when we are cross-examined on the floor of the House, as we surely will be, be able to state what it is going to cost to begin and to complete this work?

Mr. CAFFERY. It seems to me that that would be too much in the direction of a delay, and that there would be sufficient data at hand to say to Congress that there are 2,000,000 acres in this basin, and that you know from experience with other overflowed lands of the same area that it is going to cost certainly as much, and undoubtedly a great deal more, if you take the pro rata on all other Mississippi River lands.

Mr. HUSTED. Is it not a question of the number of miles of levee to be constructed, rather than a question of land to be protected? I do not see how the acreage would affect the cost. It is a question of how many miles of levee you have to construct. You may have to construct the same number of miles of levee to protect vastly different areas in different situations. You would have to know how much it is going to take to construct it. I want to get your views on this proposition. You say that you think it would be a bad thing to close the Atchafalaya; that is, to divorce the Atchafalaya from the Mississippi River?

Mr. CAFFERY. Yes, sir.

Mr. HUSTED. In view of the fact that it would raise the flood heights, when the people want them lowered instead of raised?

Mr. CAFFERY. Yes, sir.

Mr. HUSTED. What would you say as to the practicability and desirability of this proposition, and how would it be received by the people of New Orleans and of the Atchafalaya district. Instead of divorcing the Atchafalaya from the Mississippi, make the opening greater, so that the Atchafalaya, instead of taking less water than is taken from the Mississippi at the present time, when the Mississippi River is in flood stage, would take a great deal more water than at the present time, and to strengthen the existing levees on the Atchafalaya and build them very much higher and very much stronger, so as to enable it to take care of a great deal more water, and by that means reduce the flood height? How would a proposition of that kind be regarded, do you think?

Mr. CAFFERY. There would be objection to that, Mr. Husted, on this ground, that the Atchafalaya, at flood stages carries off all the water that it possibly can, and that at flood stages it now does a great deal of damage.

Mr. HUSTED. My proposition involves the building of much stronger and higher levees so that it could carry much more water.

Mr. CAFFERY. If you are going to build levees it would be better to build them on the Mississippi, because the difficulties of leveeing the Atchafalaya are greater than those on the Mississippi.

The CHAIRMAN. Would it require a great deal of revetment on the Atchafalaya also?

Mr. CAFFERY. I think it would. I think you would have the same difficulties there that you have on the Mississippi River. Further, answering the first question, I would say that this treatment of the Atchafalaya River would be a going over to the outlet theory, and that it would be the selection of the outlet at the Atchafalaya River. That outlet is doing all it possibly can. If you impose more upon that outlet you will do great damage, and you will incur great expense in guarding against that damage, whereas, if you want to adopt the outlet theory, the outlet could be placed on the Mississippi River.

Mr. HUSTED. Where would you place it?

Mr. CAFFERY. It could be placed below New Orleans on either side. It could empty into Bodreau Bay, on the right-hand side, or below New Orleans on the left. There would be several places for an outlet. If you want to adopt the outlet theory, it might not be a bad idea to combine the outletting of water from the Mississippi River with the reclamation, or the building up, of lands in some of those swamps on the route. The building up of land out of the silt of the Mississippi River is not at all beyond accomplishment.

The CHAIRMAN. That is going on progressively under the improvement of the Atchafalaya basin, is it not?

Mr. CAFFERY. No; I could not say that. While I do think that a great deal can be done in the direction of raising the swamps with Mississippi River silt and the building up of marshes with Mississippi River silt, not a great deal of that has been done. Of course, wherever there is a deposit of this silt or sediment it builds up the plantations, and the land is extraordinarily enriched. Those are plantations which are not scarified by the rapid rush of the waters. That is something which undoubtedly the control of the Mississippi River is going to lead to. I merely hazard the suggestion that that could be done. I know that it can be done, or I think that it can be done, in the country south of the Hymelia Crevasse, where there is mile after mile of marsh, so that the outlet theory, on that basis, would not be the *bête noir* that the levee people take it to be.

As to the outlet theory, I would not presume to say whether I think the outlet should be resorted to or not. I think this, that data on this question has not been sufficiently accumulated, although there are some large facts which it seems to me a man might read who runs, as to the outlets.

For example, in the testimony of Maj. Ockerson, at page 308 of the hearings before this committee, he adduces as utterly destructive of the outlet theory this fact:

A crevasse occurred at Panther Forest, 150 miles above Vicksburg, on April 12, 1912. The estimated discharge of this crevasse was 101,026 second-feet.

Salem crevasse, 35 miles above Vicksburg, occurred on the same day and carried 301,806 second-feet. Both of these crevasses were on the right-bank levee line, and discharged into the Tensas basin opposite Vicksburg.

A discharge measurement of the Mississippi River was made at Vicksburg before the breaks occurred, and showed a volume of 1,780,407 at a stage of 51.5; two days after these crevasses had occurred the stage had fallen but 0.5 foot, but the discharge was 369,220 second-feet less.

In other words, here is the Mississippi River Commission saying to you that crevasses have occurred which have taken off 402,000 second-feet from the Mississippi River; and he adduces that as a fact crushing to outlets, because the current of the Mississippi River showed that there had been a diminution of its volume by 369,000 second-feet. That shows that there has been a gain by discharging from the river 40,000 more feet than it was carrying down previously. In order to destroy the outlet theory it must be shown that the effect of an outlet is to cause such a shoaling of the river and such a lessening of the velocity of the current as will enable the river to carry down much less water than is discharged through crevasses. In other words, it must be shown that the effect on the main stream of the river is much more harmful than the effect through the crevasse is

beneficial; and the proof does not show that nor do the statistics show that. The statistics, on the contrary, show a net credit to the crevasse outlet of 40,000 second-feet. It is true, as he said, that there is only a drop of 0.5 of a foot, but, according to the theories of the enemies of outlets, there should have been a rise of 0.5 of a foot due to the existence of the outlet. So, gentlemen, with these other instances——

The CHAIRMAN. Will you pardon me for a moment? There is one question that I would like to ask, and then you may go on with the outlet theory, if you care to proceed further along that line. You will observe from this map [indicating] that the colored areas represent the territory that is now flooded by the Mississippi River through the opening of the Atchafalaya. That is an area of about 1,700,000 acres.

Mr. CAFFERY. I did not know, Mr. Chairman, that I was so nearly correct when I said 2,000,000 acres.

The CHAIRMAN. There are 900,000 plus in the Atchafalaya Basin and 800,000 plus in the Red River Basin. Of course, the levees on the Atchafalaya would not have any effect on the Red River Basin. Now, suppose in the opinion of the engineers—and we will probably have to rely on them at least in that particular estimate of the cost of construction of the levees below Red River—they can strengthen the levees below Red River sufficiently to carry the water, if the Atchafalaya should be divorced, at a cost of \$7,000,000 or \$8,000,000, and that it would cost \$30,000,000 or \$40,000,000 to levee the Atchafalaya and Red River Basins so as to protect this area, which would you then suggest that the committee should adopt?

Mr. CAFFERY. I should say, Mr. Chairman, that your safest course would be to continue the Atchafalaya as an outlet, even though the cost of the continuance would be double that of raising the Mississippi River levees——

The CHAIRMAN. Well, instead of being double, suppose it would cost five times as much?

Mr. CAFFERY. If you proceed so as to make the levees strong enough and their bases safe enough, then, of course, the thing to do is to levee the Mississippi River, but the mere building of a high and strong levee is not going to solve the problem.

The CHAIRMAN. Suppose this divorcement can be accomplished for \$5,000,000 and the strengthening of the levees can be done for \$10,000,000. That, of course, would take in all of this colored area here in the lower Red River Basin [indicating on map]. Much of this [indicating] can not, of course, be protected by any sort of a system of levees, even if levees were constructed, because, if the levees come down and join here [indicating], there would be no outlet for the natural drainage of the country, and much of this lower basin would necessarily have to be turned over to perpetual overflow.

Mr. CAFFERY. Or possibly deposits of silt.

The CHAIRMAN. Possibly so, in the course of human events. But, assuming that this generation wants to take care of that, and assuming that a levee from here [indicating], connecting with the levees below the outlet of the Atchafalaya would protect all the lower river basin, and that it would further entail, perhaps, an expenditure of \$10,000,000 to strengthen the levees below there; and that in order to protect these areas by levees it would require the

expenditure of \$30,000,000 or \$40,000,000—which of those courses do you think the committee should adopt? I am not asking you as an engineer, but as a lawyer or statesman.

Mr. CAFFERY. Mr. Chairman, I would like to have you put that more concretely.

The CHAIRMAN. Here is the point I want to get your views about: Assume that we can divorce those streams and that the cost of that divorcement, including further strengthening of the levees below there, will be \$10,000,000 or \$12,000,000, and that by leaving it open it will cost \$30,000,000 or \$40,000,000 to protect the Atchafalaya and the Red River by the construction of levees along the banks of those streams and such tributaries as may be necessary, which course would you prefer that the committee should adopt?

Mr. CAFFERY. Undoubtedly I think you should close the Atchafalaya River and improve the levees on the Mississippi.

Mr. PARKER. In estimating the cost of protecting the lower basin you have not taken into consideration the rise of the river at New Orleans which would inevitably result.

The CHAIRMAN. I have assumed that it can be done for \$12,000,000. I have started off with that premise. That may be just an assumption.

Mr. WILSON. I would suggest that the estimates of the engineers to do both these things is a trifle over \$9,000,000. If you did raise this level and put this additional rise in the river by divorcing the Atchafalaya, would your spillways help?

Mr. CAFFERY. I would say undoubtedly. I do not want to be dogmatic. From the data on the subject I would conclude, not as an engineer, but merely by the exercise of logical faculties, that spillways would aid in solving the problem.

(Whereupon, at 11.15, a recess was taken until 2 o'clock p. m.)

AFTER RECESS.

The committee reconvened in the Ways and Means Committee room in the Capitol at 2 o'clock p. m., pursuant to the taking of the recess.

The CHAIRMAN. Mr. Caffery, will you proceed now?

STATEMENT OF MR. DONELSON CAFFERY—Resumed.

Mr. CAFFERY. Mr. Chairman, the questions that you were asking when you adjourned bring up a rather fundamental weakness in our system of government, which, of course, you gentlemen can hardly be expected to remedy at this time. That condition is as to the inadequacy of the administrative departments by reason of the necessity of constant reference back to the legislative department. It was suggested by the chairman, I believe it was, that because there had been no report from the Mississippi River Commission concerning the improvements on the Atchafalaya you gentlemen were at an impasse, I might say—that you could not do anything except to call for a report from the Mississippi River Commission as to what you might do on the lower Atchafalaya.

The CHAIRMAN. That was not just exactly it. Of course, we can. We have the power, so far as the power of Congress is concerned, we

have the full power to make appropriations without any investigation whatever. We have a perfect right to go into any matter blindly, if we see fit to do it.

Mr. CAFFERY. I understand that; but Congress would not exercise its discretion to do that.

The CHAIRMAN. It would probably exercise its discretion not to do it unless it had some information as to just what the cost would be.

Mr. CAFFERY. Now, the particular question that arose was as to the leveeing of the Atchafalaya River. There is no doubt but that it would be very difficult to get any specific appropriation through the House for the reason that the chairman mentioned—that the House would want to know where would this put us? Will \$5,000,000 be enough? What are we embarking upon? That, it would seem to me, would emphasize the necessity for the projection into this Mississippi River problem of somebody with discretion, some board with discretion, a board which, you might say, would combine the administrative department with the discretionary department; a board which would have some of the features of the executive and, broadly, some of the features of the legislative. For that reason it has struck me as being eminently wise and possibly imperative that there be over the Mississippi River Commission, not so much by reason of any incompetency of the Mississippi River Commission, because it has not shown itself to be incompetent, but by reason of the difficulties of the situation, that you put over that commission a board which can exercise discretion, a board either of a number of members of the Cabinet or of some appointees of members of the Cabinet, together, of course, with the chairman, who should be selected by the President. Now, the problem that you are dealing with—

The CHAIRMAN. Just right there. Let us see if I catch your suggestion. Should this board that you speak of, composed of members of the Cabinet or perhaps some employees under the Cabinet officers, be given the power to say whether or not this particular project or that particular project should be undertaken?

Mr. CAFFERY. Yes, sir.

The CHAIRMAN. Without coming back to Congress?

Mr. CAFFERY. Without further instructions from Congress.

The CHAIRMAN. And will Congress create a commission to say whether or not the Federal Government should be committed to an improvement that would cost whatever it would cost, instead of having Congress reserve that right to itself?

Mr. CAFFERY. I want Congress to be as specific as possible in dealing with a matter so general—to have Congress place in the hands of a board of that kind, say, for the first year, \$50,000,000 or \$60,000,000; for the second year, \$50,000,000 or \$60,000,000; and with the end in view of establishing such improvements on these various rivers as may be necessary, and as to the Mississippi River in particular, as to the extension of the levee system where the levee system should be extended.

The CHAIRMAN. As might be necessary in whose opinion?

Mr. CAFFERY. As might be necessary in the opinion of that board in general, subject, of course, to cooperation or coordination between the general advisory board and the general executive board, such as the Mississippi River Commission would be.

The CHAIRMAN. The only function Congress would perform would be to furnish the money in a lump sum?

Mr. CAFFERY. For a general, specified purpose.

The CHAIRMAN. Would it be specified?

Mr. CAFFERY. Certainly; it would have to be specified for the improvement of certain rivers.

The CHAIRMAN. You would have this board report what improvements to make on some particular river, for instance, the Atchafalaya, and then let Congress give its judgment as to whether or not the Atchafalaya should be improved, and then appropriate the money for that purpose?

Mr. CAFFERY. No, Mr. Chairman; not at all. We want Congress to say, "We create this board for the purpose of dealing with this and that river in such a way as may be necessary; all to be done within the discretion of this particular board."

The CHAIRMAN. And within what limits of cost—those fixed by Congress?

Mr. CAFFERY. Of course, there is to be a practical limit upon matters of that kind.

The CHAIRMAN. What I am trying to get at is, does Congress fix the limit of cost, or leave it to the board to do so?

Mr. CAFFERY. Give the board a certain amount of money. It will be impossible, of course, to give any board or any Executive, or even any branch of the legislative, the entire purse strings of the Government.

The CHAIRMAN. I am trying to see if we can get our minds together, to see if we can see exactly what this situation is. We are to appropriate \$50,000,000 or \$60,000,000 for the first year?

Mr. CAFFERY. Yes, sir.

The CHAIRMAN. And turn it over to some board that we are creating. Now, what limits do you think should be placed upon that board? Should we designate the particular rivers upon which this \$60,000,000 should be expended, or give the board the discretion to look into the various watersheds of the country for itself and determine that?

Mr. CAFFERY. I think the rivers should be designated, Mr. Chairman. It seems to me this committee, with the data at hand, would at least know enough of the situation to know in general what work should be undertaken.

The CHAIRMAN. Then what would be the purpose of this board?

Mr. CAFFERY. The purpose of this board would be to decide how to spend that money.

The CHAIRMAN. It should be a board, then, of engineers?

Mr. CAFFERY. No, sir; that is not necessary. It would be any kind of a board.

The CHAIRMAN. Any kind of a board to tell us how the money ought to be expended in this particular improvement that we designate?

Mr. CAFFERY. Or to direct the expenditures through the various other executive institutions which it finds at hand.

The CHAIRMAN. I think I catch your idea.

Mr. CURRY. In that connection, what would be the jurisdiction, for instance, of the Mississippi River Commission in conjunction with this new board?

Mr. CAFFERY. It would be a perfectly independent body in its own sphere. If the general board thought it necessary to do certain work on the Mississippi River it could ask the Mississippi River Commission to do it, and I imagine it would be well to have it provided that the Mississippi River Commission should do certain work but within its own sphere. In so far as uninstructed by this general board the Mississippi River Commission would be what it is now, supreme over its particular department.

Mr. CURRY. Would you give this board the authority and power to impound water, to install power plants, create forest reserves, and buy lands for forest reserves and for reclamation purposes?

Mr. HUSTED. And irrigate arid lands and drain swamp lands?

Mr. CAFFERY. Of course, that is so general that there might be danger of breaking down the board's efficacy by such general instructions. I should think that with a board of men of the proper caliber you might leave it to them as to which of these works it should undertake, because there is no doubt that, say, the reclamation of arid lands is something perfectly feasible, and there is no doubt that there is some need of the establishment of a certain amount of flood control at the sources of the rivers.

Mr. CURRY. They are all feasible and all necessary. The only proposition that I was asking was whether this board should be allowed a certain amount of money to do this work without investigation and report to Congress without a specific authorization?

Mr. CAFFERY. I should think so. I should think that it would be a board of general discretion. Of course, when you establish such a board, Congress is always there to legislate over it and legislate for it.

Mr. CURRY. The only thing Congress could do would be to legislate it out of office.

Mr. CAFFERY. It could do that, or curtail its powers, if necessary; restrict its subsequent appropriations or enlarge them. It would be a creature of Congress.

Mr. CURRY. Do you think a bill could be passed that might necessitate the curtailing the powers of a board?

Mr. CAFFERY. Well, we can not look far enough into the future to say about that, but it might be found unwise to do certain of these works, and it might be well if a disposition should be shown by the board to go ahead with a work that the general opinion of the country did not approve of that Congress should shut off that kind of work and place a barrier upon such a board as this. But you are thinking here of a proposition of the utmost magnitude, and it can not be looked at except in a broad way. I doubt whether it can be handled in this way—of waiting for reports on this or that particular executive board—for Congress to act then upon that report. You have tried that system, gentlemen, for 25 or for more than 25 years. As I remarked this morning, the Burrows Commission over 30 years ago went over the identical ground that you gentleman are on to-day. It was appointed after the terrible flood of 1882, and that commission adopted the policy of reference back.

The CHAIRMAN. I think that commission probably did not recommend anything. They could not agree on anything, and made three separate reports to Congress. They could not agree at all. I have the report of the Burrows Commission here.

Mr. HUSTED. How broad was their jurisdiction?

The CHAIRMAN. It was just a general jurisdiction. They had no jurisdiction except to examine and report.

Mr. HUSTED. Upon what subject?

The CHAIRMAN. I will show you. We have that right here. Here is the resolution creating it.

Resolved, That a committee of nine members of this House be appointed by the Speaker to examine into the work now in progress for the improvement of the Mississippi River below Cairo, the methods employed in making such improvements, the contracts touching the same, and the application of the appropriations made by Congress for that purpose; also, all matters pertaining to, and the feasibility of, the outlet system for the improvement of said river; also the improvements made at the mouth of said river, the system of jetties, the extent to which the same facilitated the navigation of the river to the Gulf, their permanency, the method now employed in the improvements thereof, and into all matters touching the said improvements, the methods and effects there, and contracts touching the same.

That was a House committee for that purpose. The committee made three reports that they could not agree.

Mr. HUSTED. How long ago, Mr. Chairman, was the committee appointed?

The CHAIRMAN. That committee was appointed on August 7, 1882.

Mr. CAFFERY. The Mississippi River Commission, Mr. Chairman, was created in 1879. For the first 11 years of its existence it did not do anything upon the levees.

The CHAIRMAN. For the first 11 years of its existence?

Mr. CAFFERY. For the first 11 years of its existence it did not do anything upon the levees but spend \$3,000,000, and there is not anything on record to indicate that the Mississippi River Commission asked for any such enlargement of its powers as is now indicated is necessary in the light of present developments. In all the time since the creation of the Mississippi River Commission it has spent upon the levees about \$31,000,000, although we know that the entire levee system has cost more than \$100,000,000, and although we know that in 1912 alone the actual damage from floods was forty-odd million dollars, and although we are bound to know that in addition to that actual damage there was an additional damage due to paralysis of business and the destruction of values, psychologically, which probably doubled that \$40,000,000 damage.

The CHAIRMAN. For the first 11 years this limitation was contained in every bill appropriating money for the Mississippi River Commission:

That no portion of the sum hereby appropriated shall be used in the repair or construction of levees for the purpose of preventing injury to lands by overflow or for any other purpose whatever except as a means of deepening and improving the channel of said river.

That stayed in there for the first 11 years.

Mr. CAFFERY. That limitation was thought necessary at the time on account of the views entertained by Congress. It was considered that unless Congress should act with regard to navigation it could not deal with the rivers, and the country is fortunate that the view has since prevailed that the problem of river control is one affecting our national existence, and that we do not have to put ourselves upon the technicality of spending money for navigation in order that we may control these rivers which are destroying our territory.

Mr. CURRY. That is one of the reasons for the creation of this committee, so that we would not be bound by that technicality or law confining the appropriations made by Congress to the navigability of the rivers of the country.

The CHAIRMAN. I just read that extract to show that during those 11 years, through no fault of the commission, but by act of Congress, their activities were limited.

Mr. HUSTED. And since that time the Mississippi River Commission has spent all the moneys on levees that was available and furnished by the Government, has it not?

The CHAIRMAN. Yes, sir; the Mississippi River Commission asked for more money. Just as an illustration: In the last report and the report before the last the Mississippi River Commission asked for \$12,000,000. Last year they got \$4,000,000 for all purposes. This year the rivers and harbors bill is carrying \$6,000,000.

Mr. CAFFERY. The Mississippi River Commission, of course, is not responsible for the fact that it has been restricted in a financial way. The Mississippi River Commission would undoubtedly have done more work if had had more money, but even with money there are certain things which the Mississippi River Commission might not do, unless it had a board such as I speak of behind it or over it. Now, for example, this question of the closing of the Atchafalaya—the Mississippi River Commission has adopted the theory that outlets are destructive; that there is a shoaling process that goes on below an outlet and that the consequence is such a retardation of the flow, due to the existence of the outlet, as it makes it appear to confine all of the water in one channel and send it on down to the Gulf. Now, although the commission is thoroughly and outspokenly committed to that policy, it has never touched and has never recommended the touching of the greatest outlet of them all—the Atchafalaya—and does not dare close the Atchafalaya in conformity with its theory.

The CHAIRMAN. They have recommended, as a matter of fact, that it be not closed, haven't they?

Mr. CAFFERY. They have recommended, as a matter of fact, that it be not closed. Yes; you are right, Mr. Chairman, on that, although there have been things said on both sides of the question, but its final utterance seems to be a recommendation that the Atchafalaya outlet be not closed, which is in direct stultification of its other recommendations that we confine ourselves on the river entirely to levees. We must either adopt an all-levee theory or a theory of levees plus outlets. Of course, levees are an integral part, the basic part—

The CHAIRMAN (interposing). Would you say that we should have an all-levee theory or an all-outlet theory?

Mr. CAFFERY. Mr. Chairman, to remind you again of the fact that I am not an engineer would possibly be the best answer to that question. It would be not only dogmatic, but presumptuous in me to say whether we should have outlets or not. All that I would say in that regard is that the scientific mind is not a dogmatic mind, but is an inquiring mind, and I say that in connection with the dogmatism of the Mississippi River Commission, denying that there can be relief from any other measure than the building of the levees and in the next breath telling you that the greatest outlet of all must not be closed. Now, in regard to the closing of this outlet—and it was with particular regard to that that I was asked to appear before you

gentlemen—the situation is that the higher flood level, due to the establishment of the levee system, has thrown down upon the Atchafalaya basin a flood which it would not have had but for the levees. If an ordinary individual had perpetrated such a flood upon the people of the Atchafalaya, that individual would probably be bankrupted in damages. There could be no escape from liability on the part of the United States for such damages but behind the sovereignty of the United States; behind the doctrine of *damnum absque injuria* with regard to the injurious consequences of works undertaken by the Government within its sphere.

The CHAIRMAN. Now, in view of the fact that the State of Louisiana has put \$3 into these levees which have caused your trouble for every one that the Federal Government has put in, would not the State of Louisiana be called upon to stand at least three-fourths of the damage done?

Mr. CAFFERY. The levees above Red River have been put in by the Government, Mr. Chairman, I think. The State of Louisiana, of course, would owe her pro rata of that damage below.

The CHAIRMAN. Above the mouth of the Red River there are no levees on this side of the river for quite a distance—not until you reach Vicksburg. There are no levees at all on the opposite side of the river from the Atchafalaya mouth, and there are none in Louisiana on that side up to the mouth of the Arkansas River, practically, because the levee lines built along Chicot and Desha Counties are constructed largely by the State of Louisiana.

Mr. CAFFERY. But the fact remains that the heightened flood level is due entirely to the levee system.

The CHAIRMAN. Undoubtedly.

Mr. HUSTED. As I understand you, you take the position that in view of the fact that the Federal Government has expended money in the construction of levees which have raised the flood heights and have worked damage in the Atchafalaya country as a consequence, the Federal Government is morally responsible for the damage which it has caused in the Atchafalaya country by reason of its contribution toward the cost of the construction of these levees. Is that your position?

Mr. CAFFERY. I would not say that, because the work that has been done has been done for a United States governmental purpose. I say that if an individual had done that work the individual would be liable.

Mr. HUSTED. And yet I think you went on and said that the only security from liability on the part of the Government was by hiding behind its sovereignty. In other words, that the Federal Government would be morally liable and could only escape from liability by reason of the fact that it is a sovereign.

Mr. CAFFERY. Well, I do not think it should be put that way.

Mr. HUSTED. I simply asked you if that is the reason.

Mr. KEARNS. From a lawyer's standpoint, I think that would be true.

Mr. CAFFERY. I do not know that it would be fair to the Government to put it that way, because I think the Government would recognize as legal any obligation which was moral. I would not want to attribute to the Government any such immorality as you speak of there. The theory of nonliability of the Government for

such damages as this is wrapped up in the Government's duty to do governmental work, and if it does that governmental work wrong, but in good faith, I can not see that there is a moral liability. There might be, but I would not want to contend for that.

Mr. HUSTED. Do you contend that the people of the Atchafalaya have a just claim in right in view of the fact that the Government has contributed towards the building of these levees—that the building of levees has raised the water level and has produced damage in the Atchafalaya country—do you think that they have a just claim, founded in right, to expect the Government to assist them in combating these more onerous conditions?

Mr. CAFFERY. Undoubtedly, as to combating the onerous conditions. I thought you referred to the damages. As to combating more onerous conditions, I think there is an undoubted liability.

Mr. HUSTED. If that is true, what would you say as to the liability of the Government—that is, the moral liability of the Government—for damages due to crevasses in these levees which the Government either built or assisted in building?

Mr. CAFFERY. There is no such liability.

Mr. HUSTED. What is the distinction? I can not see any distinction if the Government has built a levee which breaks through and causes damages—why is not the Government just as much obligated to make good that loss as it is to make good the loss of the Atchafalaya country?

Mr. CAFFERY. To my mind the distinction is perfectly clear. To my mind the Government has built the levee where the crevasse occurred for the purpose of holding the water back. The Government has built the levee with the expectation that there would be no crevasse, in good faith and with the best efforts to prevent a crevasse, whereas, on the Atchafalaya, the Government leaves the Atchafalaya open. The Government subjects the Atchafalaya lands to continued inundation and damage. I think that is a vast difference.

Mr. HUSTED. Well, the purpose of the Government is equally good in one case as it is in the other.

Mr. CAFFERY. No; because the Government can repair the damage in the Atchafalaya and has never done it. Until the Government deals in good faith—until the Government deals justly with that condition—then equities will arise.

Mr. MARTIN. Has the Government ever built any levees at all on the Atchafalaya?

Mr. CAFFERY. I think not. The Government has dealt in good faith and has dealt justly with the crevasses; there should not be any liability there.

Mr. HUSTED. Then would you say, if the Government was not in position to expend a sufficient amount of money to protect the Atchafalaya from the consequences of floods due to the high waters of the Mississippi River, that the Government should not expend any more moneys on levees or should not build any more levees on the Mississippi?

Mr. CAFFERY. You say if it does not find itself in a financial condition to build levees on the Atchafalaya?

Mr. HUSTED. Well, if it is not in condition to do it, as it is not at the present time. For instance, no surveys have been made. It would take a long time to make the necessary surveys, and it would

take a great deal of money to make those surveys, and it is a question as to whether the scheme is altogether practicable from the standpoint of cost. If the Government is not in a position to undertake that now, do you say that the Government has any right to expend moneys in building further levees or higher levees on the Mississippi River which will work further damage in the Atchafalaya country?

Mr. CAFFERY. Yes, sir. Then the greatest good to the greatest number would supervene.

Senator BROUSSARD, of Louisiana. Would you permit me, Mr. Chairman, to state the essential difference between the damage done as regards the moral obligation of the Government by a crevasse and the damage on the Atchafalaya, which has been mentioned?

The CHAIRMAN. Yes, sir.

Mr. CAFFERY. Certainly, Senator.

Senator BROUSSARD. The doctrine that applies to a crevasse is the doctrine of force majeure. It is a power beyond control, which no man is bound to account for; while the other proposition is the damage resulting from the application of a scientific investigation, the effect of which is bound to be known to the medium that exercises it. So if the Federal Government in building levees, in a praiseworthy effort to conserve property, neglects to look at the effect on others than those intended to be protected of the work to be done, and thereby causes damages to arise in some other section, which it is bound to take knowledge of, there is the moral obligation of righting the damages created by the conditions resulting from this scientific work. If the Lord comes along with a storm and causes the river to break over the banks, or if a common enemy cuts the levee, etc., these are not chargeable to the Government. It is a power which the Government can not control. Such a force vitiates any contract, written or implied, where such force strikes.

The CHAIRMAN. Senator, there is another question that is before us, if Mr. Caffery will pardon me.

Mr. CAFFERY. I shall be only too glad.

The CHAIRMAN. I would like to ask your opinion about it, because it is a very vexatious problem, and it is now before this committee. Along the east bank of the Mississippi River, from a point just below Vicksburg down to a point in the neighborhood of Bayou Sara, I think, there are no levees, and from a point in Tennessee below Bessie down to the neighborhood of Memphis there is a similar condition. The area of this strip is so narrow that, after very thorough investigation, the commission reported that the levees necessary to protect it would cost a great deal more than the value of the land itself, or what the land could be bought for. Now, the people of Arkansas and the people of Mississippi and the people of Louisiana—I mean those three States, principally—assisted somewhat by the Federal Government, by raising flood heights have brought about a condition which has proved very disastrous to these people. Now, I would like to get your opinion as to the obligation of the people of Louisiana, Arkansas, and of the delta portions of Mississippi, as well as that of the Federal Government, if there is any obligation imposed upon them touching those conditions?

Senator BROUSSARD. It occurs to me that a similar question was submitted to the supreme court of your State not long ago.

The CHAIRMAN. Yes; unfortunately, the States have decided that the people have no rights in the matter. There is no way for them to get any damages. I believe that is true in Louisiana, and it is true in Mississippi. I am not sure whether it is in Arkansas, but we are not talking about legal rights now.

Senator BROUSSARD. You are talking about moral obligations.

The CHAIRMAN. Yes, sir. Of course, you can not go into the courts, so far as legal rights are concerned, and get anything for the overflows in the Atchafalaya. We are talking now about such rights as this committee ought to take into consideration.

Senator BROUSSARD. I will answer the question in this way—

The CHAIRMAN. I ask it to get your opinion, because it is a very vexed problem and one that the committee wants to be enlightened upon.

Senator BROUSSARD. I believe that all of the work that will be done as a result of this very investigation that you gentlemen are conducting now is the solving of all flood stages in rivers that overflow their banks everywhere. I believe eventually all that will be accomplished. It is a big proposition. I do not expect to see it done during my service in Congress, or possibly in the service of any of you gentlemen who are here, but that will be the ultimate outcome of the movement that is going on throughout the country now, to utilize this great wealth which is now going to waste. I think the obligations of the Government, the question of which has been raised in these hearings, that whatever is being done at this moment, and whatever may be done next year, and whatever may be done in the next 10 years ought to be done primarily to give the greatest benefit to the greatest number of people, and finally to give every man that protection to which he is entitled.

If one should embark upon the policy of reclaiming these properties; if one should embark upon the policy of utilizing the waters of this country; if one should embark upon the policy—a national policy, of which this is the beginning—it should be conducted along the lines of taking whatever measure of money may be contributed this year or by this generation to solve the most important propositions with the purpose of doing first those things that affect the greatest number of people, and as you go along solving these propositions you finally, in the culmination of the great work, reach just such communities as you referred to awhile ago. The obligation exists of protecting all from the moment you gentlemen adopt the policy, but you gentlemen have not started the policy. It was started before your time. Once the Government has assumed the responsibility to do that work, the obligation, even as to the solitary citizen, is in my judgment as binding as to an entire country and as to the entire project. But it would be folly, in my judgment, as men who legislate and plan this thing and who furnish the funds to do it, to look after the community with 10 individuals who are being harmed by the same conditions which caused a loss, say, in Ohio, of \$100,000,000, or in Kansas of \$40,000,000, and in the Atchafalaya Basin of many millions yearly—to put all in the same category, and say, because you are protecting that loss of \$100,000,000 over there, that you should at the same time protect this loss of \$10,000 over here.

In other words, the policy must be a progressive policy, and, as I tried to explain my views to this committee on this matter yesterday,

what I fear is that unless we go about the solution of this great problem, the greatest in its details that we have yet undertaken—unless we do it upon some scientific basis and through the domination of some central power to reach out to all of these other powers, instead of approaching disjointedly and without cooperation, we shall not have preserved to future generations the full benefit of the value of this water power, and it will be a crime—not a mistake; it will be a crime—if in adopting a policy we shall treat it locally instead of nationally and thereby lose the benefits of the full value of this power.

I do not want to go into this subject further, but that is my view of it, and the Government is morally bound, having once adopted the policy, to protect all, but all are not entitled nor can they hope to have the preference of protection immediately. Larger communities suffering from the same cause and destroying immensely more wealth at each recurring flood are entitled to the immediate attention.

The CHAIRMAN. You say the Government is responsible. Do you couple with that the three States that are not equally responsible, but in the ratio of 3 to 1?

Senator BROUSSARD. I am not speaking locally. I am viewing this question from the broadest possible view.

The CHAIRMAN. I understand that, but we want your opinion on that particular question.

Senator BROUSSARD. You know, the laws of Louisiana are different.

The CHAIRMAN. Part of this land is in the State of Louisiana which I have spoken of. Here is my question. You know that particular question is here. It is already here with us, just as this Atchafalaya question is. Those people say they have been vastly damaged; property has been taken from them—that is their claim—by the joint action of these States and the Federal Government. But their petition is to the Federal Government. Now, I just wanted to get your view upon that point. If anybody is to reimburse them and make them whole, ought the burden to be borne by the Federal Government, because it has consented to be persuaded by the States into contributing twenty-five cents while the States themselves were contributing seventy-five cents out of every dollar which went into the work that created their unhappy situation?

Senator BROUSSARD. I want to bring this thought home to the chairman of this committee: Anywhere in Louisiana that the river shifts its channel the levee must be reconstructed, which is a matter of yearly occurrence; that is, at least, it follows at numerous points after each overflow, and it becomes necessary for the levee board and the Mississippi River Commission to construct the levees some distance—sometimes one-half a mile—probably through property in the highest state of cultivation, with the home of the property owner located on the spot. There is no money paid to the owner of that property when the levee is built behind his house and his house turned into the river. The Government exercises its power to the extent of condemning all of the improvements of such party without indemnity.

The CHAIRMAN. You mean the State government?

Senator BROUSSARD. The State government; but the Federal Government does it through the instrumentality of the State, because the Federal Government will participate in the building of a levee behind a man's house, and there are plenty of such houses which are in the river now.

The CHAIRMAN. The Government, however, never locates the levee line.

Senator BROUSSARD. The State government now locates the levee lines.

The CHAIRMAN. No; it never does.

Senator BROUSSARD. It goes out and builds a levee and puts property in the river. That is done because the Federal Government has no right of confiscation, while the State has the right; but they consult with the Federal engineers when they put the levee behind a man's house. I will state one instance of that character.

Mr. KEARNS. That is not a parallel case to that down in the Atchafalaya district.

Senator BROUSSARD. Here the property is put into the river. I remember the case of a widow owning a home where the bank commenced to cave in, and it became necessary to move the levee and to put her property entirely outside of the levee. Within a very short while, of course, the waters came to the house and everything went out. The levee board, in sympathy for this widow, raised a subscription to buy her another piece of property, and moved her improvements on the new property.

Mr. KEARNS. Here is the distinction. There was no obligation to build this levee.

Senator BROUSSARD. Of course there was none. But the proposition submitted by the chairman was this, that these people complained that their property was entirely destroyed because of the work of the Government, and I wished to state a case where, but for the charity of individuals, the property, not only the land itself, but the improvements on the land, would have been destroyed—a much stronger case.

Mr. KEARNS. Because of the overt act of the State government and the Federal Government, they had thrown the water deliberately down on these other people's property?

Senator BROUSSARD. They had not thrown the water deliberately on the land in the sense of condemning it. The water went there because of the work done elsewhere, but there is no question about the moral responsibility, and I have answered that. The question that we are trying to answer is the equity of refunding the money. That equity does not exempt any more than in the case cited, for the reason that there is no legal responsibility under our laws. The other proposition is this—

Mr. CLINE. There is no remedy for the woman whose property was taken?

Senator BROUSSARD. No remedy at all.

Mr. HUSTED. They took the property, as I understand it, subject to that liability.

Mr. KEARNS. They simply built a levee behind the property.

Mr. HUSTED. When they got the property originally they took it subject to the possibility that the levee line might be changed.

The CHAIRMAN. That is it.

Senator BROUSSARD. The theory is that, having located there, the settler knows that there is a caving in of the banks, and eventually the banks may cave in up to his property, and that they may be forced to take the property, and they do take it when necessary.

Mr. CAFFERY. That does not apply to city property?

Senator BROUSSARD. In New Orleans they have arranged that differently.

Mr. CAFFERY. Yes; or in any other city.

Senator BROUSSARD. It is on the same principle that the Government took property of an individual, because a riparian owner must take notice when he locates there that the Government may come along and take the property.

I was applying the question of equity as to the case I cited. There is another case, without wishing to make any personal reference to myself at all. Property that I own in the district is not subject to overflow, but I am taxed for it upon the theory that it is surrounded by property that does overflow—on the theory of greatest good to greatest number. Those above water and not subject to overflow must contribute their share to the building and the maintenance of these levees, and we have been doing it all of the time. So these equities occur all the time, but in solving this proposition the smaller equities must stand aside for the larger equities—the greatest good to the greatest number. Wherever damage can be stopped entirely it should be done, in my judgment.

Mr. KEARNS. I would like to get clear on this. I have heard something about these cases that have been tried in your State. Is it your statement that above the mouth of the Atchafalaya the Federal Government and the State governments have built a line of levees to keep the water from overflowing their country, and that if they had not built the levees that water would have spread out over that country and not over the Atchafalaya?

Mr. CAFFERY. It would have spread out over the whole country, including the Atchafalaya.

Mr. KEARNS. You claim that the building of these levees causes a greater volume of water to go down on the Atchafalaya district and does greater damage in the Atchafalaya district than otherwise would be done? Is that your position?

Mr. CAFFERY. Yes, sir.

Mr. KEARNS. Before we get off that—you say there have been two or three cases tried in some of the States for damages. Is that right, Mr. Chairman?

The CHAIRMAN. Yes, sir.

Mr. KEARNS. And those cases were always decided adversely to the plaintiff?

The CHAIRMAN. Yes, sir.

Mr. KEARNS. But were those cases tried on their merits or were they thrown out of court on some technical ground; that is, that an individual did not have a right to sue the State?

The CHAIRMAN. No. That they had no cause of action; the district was not liable for that character of damage.

Mr. KEARNS. Have you a law by which an individual can sue the State?

The CHAIRMAN. The suits were not against the State. The suits were against the levee boards and they can be sued just as any other

corporation. A suit does not lie against the State. It lies against the levee boards. In Mississippi they decided that the only damage a man could recover in addition to his pay for the right of way was for the damage that the levee did to the drainage of his land.

Mr. KEARNS. I understand that.

The CHAIRMAN. And that is all. The mere fact that it put the water up 10 or 12 feet instead of 2, was not an element of damage for which he could recover against the levee board.

Mr. KEARNS. If the county should build a bridge across a stream, and in building that bridge place a pier in the stream, and that pier should divert the course of the stream over on your land, you could sue the county and get damages?

The CHAIRMAN. Yes, sir.

Mr. KEARNS. Is not that a parallel case of throwing the greater volume of floods on the land?

Mr. CAFFERY. The facts, if you will permit me—the facts are the same, but the defendant is different.

Mr. KEARNS. That is my point.

Mr. CAFFERY. The defendant is the State of Louisiana and the United States of America, which is a great difference.

The CHAIRMAN. In Louisiana, you understand, Mr. Kearns, the law is different from that in any other State. The original grant under which every private individual holds a title outside of the cities is subject to this servitude: The land may be taken for levee purposes, and there is no payment for the right of way. The State engineer locates the levee line and may throw your property out on the river side. He not only does not pay you for the land that is thrown out, or pay you damages for the land that is thrown out, but he does not pay you for the actual land taken.

Mr. CAFFERY. I did not exactly explain as to the cities, Mr. Chairman. It is not so much a location in a municipal corporation, but the difference is that in the cities the land is generally divided up into lots, and when you take a lot you take all a man has; whereas in the country, when you take property, you take from the front, and the theory in the country is that the building on the front benefits the residue of the property. But in the cities there is no residue after you take what a man owns in there.

The CHAIRMAN. Suppose you throw out a man's entire plantation in the country?

Mr. CAFFERY. We have never had a case of that kind.

Mr. WILSON. I think there was such a case in Concordia Parish, one entire plantation—Mr. Davis, of Vidalia.

Mr. CAFFERY. I think he would come under the principle that prevails as to city lots. He should.

Mr. WILSON. That particular matter has not been in court, but it was generally accepted that he was not entitled to any compensation whatever.

Mr. CAFFERY. The principle of the city law might save him. With regard, Mr. Chairman and gentlemen of the committee, to the question of the selection of some board which shall remove the inherent defectiveness of the present situation of the legislative in one part of the country and the executive in another, it might not be treating this subject in too big a way to establish over it a regular Cabinet

officer; to create a Secretary for the internal improvement of waterways. There is not any question whatever that by wrestling with these rivers we can save from their grasp as much territory as the successful nation in Europe is going to get out of the present war. If by the expenditure or concentration of effort on this problem we can bring to this Nation territory of equal extent to that which so many millions of lives are being lost for, it would seem to me that that would be something which would put this problem on a much solidier footing than that of the improvement of navigation. It nationalizes it, and it seems to me that in time it will be necessary—and, in fact, I do not know but what this is the time—but it would seem that we would evolutionize in that direction at any rate to have a special department of the Government created to deal with this problem. We need either a Cabinet officer with his organization or we need at least a minimum such a commission as I have spoken of.

The CHAIRMAN. I would like to ask you, Mr. Caffery, this question, because you have given it a good deal of thought: Just what are the advantages you think would follow in having a commission of laymen, say, to overlook this general work and determine for the scientific agencies under them just what work shall be done and what money shall be allotted to these various works selected? Just what, in your opinion, is the advantage of such a commission over this committee of Congress?

Mr. CAFFERY. The advantage would be that of having a brain to deal with the problem instead of a hand.

The CHAIRMAN. In other words, you think this committee would do very well for a hand, but not for a brain?

Mr. CAFFERY. No, Mr. Chairman; I was speaking of the suggestion with regard to such commissions as we have.

The CHAIRMAN. I am not sure but that is a good answer.

Mr. CAFFERY. I understood that you were referring to the commissions that we were struggling along with.

The CHAIRMAN. What advantage would there be in this commission which you propose to oversee the activities of the Mississippi River Commission and other engineering agencies that would be employed to execute the work on various streams throughout the country designated by this commission which you wish to create—this commission to designate the various streams to be treated and allot whatever funds are necessary to prosecute that work? What advantage would that commission, in accomplishing this desired result, have over this committee acting in its capacity as a legislative committee and directing these activities?

Mr. CAFFERY. I think that this committee should be continued, no matter what departments or what commission you create. You are bound to have such a committee as this to act coordinately with any department or any commission you create.

The CHAIRMAN. But you do not seem to catch my point. You think there ought to be somebody, some commission, some body of men to determine just what watersheds of the country should be treated and to determine how much money should be allotted to that watershed, the work, the treatment itself, to be carried on by some technical agencies, either the engineers of the Army, or the engineers of the Department of Commerce and Labor, or the engineers of the

Agricultural Department, or of the Interior Department. Now, what would be the advantage, in your opinion, in having this commission of laymen directing all of these things and determining all of these things, over a committee of Congress that to-day does that same thing?

Mr. CAFFERY. The difference would be, Mr. Chairman, that the committee can not execute.

The CHAIRMAN. Well, this commission, as I understand it, would not execute.

Mr. CAFFERY. The Cabinet department would execute, or a commission would execute. A commission would combine the brain and the hand. Now that we are discussing this committee, this committee is brain, but this committee is not hand.

The CHAIRMAN. Is it in your contemplation that this commission which you propose to create to oversee the work, as I understand it—

Mr. CAFFERY (interposing). No, sir; more than to oversee. Not merely to oversee, but to be a part of the work.

The CHAIRMAN. Is it your thought that the commission would actually go upon the ground and do the work, or would it not designate agencies to do that?

Mr. CAFFERY. In designating the agencies, Mr. Chairman, it would be doing the work.

The CHAIRMAN. Then this committee, for instance, does the work. Suppose we should undertake to improve the Atchafalaya in accordance with your views, whatever they happen to be—and to be entirely frank, I do not know yet whether you want it divorced, or whether you do not want it divorced—but taking your view of the matter on that subject, if this committee should undertake now to do it, it would designate the agencies to do it, and according to your theory, would therefore do it itself?

Mr. CAFFERY. I think, Mr. Chairman, that any board which would be in such close touch with the executive department as such a board or such a Cabinet organization as I have referred to, would necessarily be much more effective in producing results than any committee of Congress could be.

The CHAIRMAN. I would really like to hear your reasons for that. The multiplicity of duties which they have to perform in addition to these of the commission would certainly be no less than the various duties which this committee is called upon to do.

Mr. CAFFERY. One illustration of that is in the very objection that you urge to the expenditure of money in the Atchafalaya. You are not in sufficient touch with the Mississippi River Commission.

The CHAIRMAN. I think that it is hardly fair to say that we urge an objection to the treatment of the Atchafalaya.

Mr. CAFFERY. That is very true.

The CHAIRMAN. The fact is we are engaged in a very earnest effort to ascertain what ought to be done on the Atchafalaya, and we would like to have you state directly, if you can in a few words, whether you think it ought to be divorced or not.

Mr. CAFFERY. Mr. Chairman, I will do that, but with regard to the suggestion as to your urging a point as to the nonimprovement of the Atchafalaya I will merely say this, that there has not been anything; that I recognize thoroughly how earnestly this committee

is grappling with the problem before you and how conscientiously you are proceeding with the task; but questions were asked me which indicated that nothing could be done with the improvement of the Atchafalaya because you did not have sufficient data. I merely took it that those questions constituted an urging that you could not do anything in the absence of such data.

The CHAIRMAN. Right on that point, Do you believe that any commission we would create, either of Cabinet officers or otherwise, would authorize any agency of the Federal Government working under them to go into the Atchafalaya and do the necessary work there without having first obtained the necessary data and without having first had the necessary surveys made and having ascertained the cost of it?

Mr. CAFFERY. Such a commission would be a part of the situation. Such a Cabinet organization or such a commission as I have referred to would not have to wait to get a report from this or that commission, but it would have the commission at its beck and call, and would ascertain to-day what is necessary to be done to-morrow, and it would not have to wait to find out at one session of Congress what the executive board thinks ought to be done, and then at another session of Congress refer back to Congress as to whether it should be done.

Mr. FOSTER. It is your idea that it ought to be taken out of the hands of Congress and that some commission ought to run all of this thing and do it all?"

Mr. CAFFERY. I do not advocate taking it out of the hands of Congress, but having Congress recognize it and do something in this matter.

Mr. FOSTER. We all know that Cabinet officers have just as much to do and that their various duties are just as great as those of any Member of Congress or any committee of this committee. You believe that, do you not?

Mr. CAFFERY. Oh, yes; undoubtedly.

Mr. FOSTER. They could only give them such attention as they could find time for, but they would have to rely on someone under them or someone in their departments to do it. Is not that a fact?

Mr. CAFFERY. Yes; but the Secretary of War proceeds——

Mr. FOSTER (interposing). Now, then, is that better than a committee of Congress who sits down as this committee has been doing for several weeks trying to study this problem? Do you think that they could give more attention than the committee?

Mr. CAFFERY. The committee could not conduct the war with Mexico.

Mr. FOSTER. We all recognize that, but that is not a parallel proposition to this at all. You have got one established head in the War Department. You have not got three or four Cabinet officers or a commission to get together and pass upon these propositions. You would have in that case. Now, then, as the chairman said, how in the world are you going to do that work unless you have some agency that goes out and makes your surveys and makes your estimates to ascertain what to do, and do you not think that Congress has the right to know what is going to be done and what it is going to cost?

Mr. RUSSELL. Before they start to appropriate a lot of money?

Mr. CAFFERY. With regard to that, I believe it is the verdict of history that every battle which was ever fought by a debating society was lost.

Mr. FOSTER. That is not the proposition. Get down to brass tacks and tell us what you think of this proposition. Do you think that this should be taken out of the hands of Congress and that we should appropriate \$50,000,000 or \$60,000,000 a year and say that we will not have any supervision over this amount of money? Is that what you mean?

Mr. CAFFERY. I think that Congress can not do anything in such a way. It has been demonstrated. It had just such a committee as this in 1883.

Mr. FOSTER. So you think that Congress is not competent to do that?

Mr. CAFFERY. Far from that. There is no use for me to say how highly I regard Congress in this matter, but Congress has been grappling with this thing for 50 years and has not made any progress.

Mr. FOSTER. You live down close to the Atchafalaya?

Mr. CAFFERY. Yes, sir.

Mr. FOSTER. You have not yet told us what you think ought to be done. Tell this committee what you think ought to be done—what, in your judgment, is the thing to be done down there.

Mr. CAFFERY. Congress ought either to close the Atchafalaya River or levee it.

The CHAIRMAN. Now, which?

Mr. FOSTER. Now, which? That is the proposition.

Mr. CAFFERY. My opinion must necessarily be based upon the data which I get from the experts who are the engineers. That data is that the Mississippi levees below the Red River would not stand the closing of the Atchafalaya outlet, and that, as matters stand, you can not close the Atchafalaya. Therefore, I am opposed to the closing of the Atchafalaya, as matters stand.

The CHAIRMAN. But the engineers say that the cost of raising the levees below there, as I recollect it, would be \$7,000,000. That \$7,000,000 will raise the levees below high enough for protection.

Mr. CAFFERY. That is not the whole difficulty. The raising of the levees high enough does not solve the difficulty at all. The worst disaster we ever had was the Hymelia crevasse, which occurred at a magnificent levee because of the weakness of the foundation of that levee, and the engineers have not reported, and I do not believe there is any way on earth for them to report, as to what it will take to make the bases of the levees safe from Red River to New Orleans.

The CHAIRMAN. Then you are opposed to closing the Atchafalaya?

Mr. CAFFERY. As a practical matter, I would say yes. Theoretically it ought to be done.

The CHAIRMAN. We mean practically, of course.

Mr. CAFFERY. Practically it is a dream to think about closing the Atchafalaya. It is a dream to think about closing it.

The CHAIRMAN. Then you think it ought not to be closed?

Mr. CAFFERY. I do.

The CHAIRMAN. That is your deliberate opinion, after the thought and study that you have evidently given to the subject. You have now arrived at the conclusion that the Atchafalaya should not be

closed. I would like very much to get your opinion succinctly stated.

Mr. CAFFERY. I would not, looking to the future.

The CHAIRMAN. Of course, we can not legislate for the past. The only service you can render us is to enable us to act wisely in the future because the past must take care of itself. We must deal now with the future. We would like very much to get the benefit of your judgment, after the care and time and thought that you have devoted to this subject. I would like to have the benefit of your opinion whether or not Congress should by legislation—of course, to be enacted in the future—provide that the Atchafalaya shall be divorced from the Mississippi River.

Mr. CAFFERY. Under present conditions it would be dangerous and impossible to close the Atchafalaya.

Mr. MARTIN. That being true, do you or do you not think that the Congress should proceed to levee the Atchafalaya as fast as possible?

Mr. CAFFERTY. Inasmuch as the closing of the Atchafalaya is an impracticability, then the only alternative is to deal with the Atchafalaya as a part of the Mississippi River system, which it is, in fact, and dealing with that system, in fact; why, it should be leveed in the same measure that the lower Mississippi River is leveed. The Atchafalaya presents some very difficult problems, and its leveeing will be quite expensive, but a great deal can be done there in the direction of saving the people from the increased heights which have been caused by the levees.

The CHAIRMAN. May I ask one other question? Practically the same area is subject to overflow from the Mississippi River in the Red River Basin as in the Atchafalaya Basin.

Mr. CAFFERY. You mean the same area that comes down the Red River?

The CHAIRMAN. No. The area that is overflowed in the lower Red River Basin from the water that passes from the Mississippi River out through that opening is about the same as the area in the Atchafalaya Basin that is overflowed from the same cause. One is 900,000 odd acres; the other is 800,000 odd acres. Now, is it your opinion that the obligation is just as heavy upon Congress to take care of the flooded area in the lower Red as it is in the Atchafalaya?

Mr. CAFFERY. Wherever the flood is raised that obligation exists.

The CHAIRMAN. That is what I mean. Now, do you have any idea at all as to what it would cost to control the flood so as to prevent the overflow of the area there in the basin of the lower Red?

Mr. CAFFERY. No, Mr. Chairman; I could not give you any information on that.

The CHAIRMAN. Don't you think, then, that as Representatives in Congress who are, whether wisely or not, charged with the responsibility of spending the people's money, we ought first, before we undertake to do that, to have the matter surveyed by a competent agency and a report made to us as to the ultimate cost?

Mr. CAFFERY. Mr. Chairman, I think you could get a very approximate figure from the chairman of the Mississippi River Commission and from the president of the Louisiana State board of engineers in five minutes.

The CHAIRMAN. You do not think, though, that Congress ought to rely upon estimates furnished by any outside agency, disconnected

with the Government and not responsible to the Federal Government? Don't you think, rather, that we ought to act upon the advice of engineers who are employed by the Federal Government and responsible to the Federal Government, so far as making the surveys and examinations and reports on that is concerned?

Mr. CAFFERY. I understood from some of you gentlemen that the function of this committee was to cut away as much of the red tape as possible; and inasmuch as the Federal Government engineers cooperate with the State engineers in doing these great works, I would not see any objection whatever to getting some estimates and data from the State engineers.

The CHAIRMAN. No. Do not misunderstand me. But don't you think that that data ought to be at least checked over by some engineer who is employed by the Federal Government and responsible to the Federal Government?

Mr. CAFFERY. I think so. I do not see any reason why a conference of that kind should not be held, but it strikes me that that data can be obtained by any committee of Congress without any delay.

The CHAIRMAN. Well, we were advised by the commission that they had no such data and could not give it to us unless there was some authority for them to make an investigation and subsequent report.

Mr. CAFFERY. I should think, Mr. Chairman, that there are a hundred engineers who know that situation well enough, either Government engineers or State engineers, to give you within an approximation of 10 per cent of the ultimate cost what it will cost to handle these districts.

The CHAIRMAN. Well, we would not want any nearer approximation than that.

Mr. CAFFERY. The delay in matters of this kind is doing great damage. We had an overflow in 1912. We were threatened with one this year. We did have one this year in one part of Louisiana. We have been relying upon the verdict of our engineers that the all-levée system is the way to save the valley, but not once except in 1898 have the levees saved the valley.

The CHAIRMAN. Do you think that is the fault of the engineers, or the fault of Congress? Don't you think that if Congress had given the engineers the necessary money long ago it could have been done?

Mr. CAFFERY. It would be difficult to say.

The CHAIRMAN. Do you think that if the Government gave the engineers the money now they could solve the question?

Mr. CAFFERY. No; I would not say that they could.

The CHAIRMAN. Well, then, is there any wisdom whatever in making these appropriations?

Mr. CAFFERY. Yes; you can minimize the danger. You can build your levees high, you canrevet your levees, and you can get mechanical crevasse-closing outfits, but I do not think there is any human way to search out all the weak foundations in the levees from Cairo to the Gulf.

The CHAIRMAN. Would you advise, then, that we proceed, or that we stop now until some human agency—we have to rely on them—can come to us with assurance that will satisfy all of us that here is the particular way to do it?

Mr. CAFFERY. We have to proceed with the material we have in hand, Mr. Chairman. We can not wait until we are sure of a certainty that the money that is spent is going to remedy the evil. We are dealing with something too elusive for that. If we wait, we will wait forever. There is no power that will be on earth that will guarantee us security against the Mississippi River. Possibly if the base of the levees was concrete all the way down it might be done, but we do not know how deep the river would strike in under the concrete base. But with a good high levee and with revetments at ordinarily weak places, we have every reasonable assurance that we can escape a repetition of the flood of 1882 and of 1912, particularly if in addition to levees, if in addition to revetments, we avail ourselves of the crevasse-closing devices which can be made, or the remedies for tying the ends of the levees when a crevasse occurs, and for having cribbing that can be drawn out into the mouth of the crevasse, cribbing that will not float water, cribbing that can be anchored. If we spend money in that way, if we get fixed in that way, and crevasses occur, we can close them, and possibly in that way we can say with certainty that the Mississippi Valley can be made safe. But the Mississippi Valley can not be made safe by levees alone.

The CHAIRMAN. You speak now as an engineer or an attorney?

Mr. CAFFERY. I am speaking with regard to the large facts which have developed—the larger facts which appeal to an attorney or to a judge as much as to an engineer; to the larger facts which do not require expertness. But when dealing with these larger facts which are apparent to all of us, why, then, I think I have as much right to my opinion as an engineer, especially when the engineers have told us that levees only can make the valley safe, and when levees only have never made it safe.

The CHAIRMAN. Have they yet been completed up to the standard that the engineers have said would make it safe?

Mr. CAFFERY. I think not, but they have been working on it for a great many years. They have spent a great deal of money, and they have not put Congress in default in the way that you indicate by saying to Congress, "Unless you give us so much money, we can not be responsible for the results."

The CHAIRMAN. They do tell us that; they have been telling us that for 13 years.

Mr. CAFFERY. They have always asked for more money.

The CHAIRMAN. I had had 13 years' experience on the Rivers and Harbors Committee, and it has always been the statement of the engineers that unless they got money to complete the levee line up to the proper height—to the height which they prescribed—the disasters would continue, though greatly decreased in number and minimized in extent.

Mr. CAFFERY. They are undoubtedly entitled to credit for having asked for more money than they have gotten. But as to our having no guide but the opinions of the engineers, I want to say that the engineers do not explain why it is that we must be confined altogether to the levees-only system. The engineers speak derisively and contemptuously of anybody who proposes outlets, and yet when the engineers come to disprove the outlet theory all they do is to prove that there is a certain shoaling up below the crevasse. But they do

not say that there is any diminution in the flow of the river below the crevasse equal in amount to the flow of the river out of the crevasse, and at the same time they do not come to you gentlemen and say: "We are so convinced of the efficacy of the levee-only system that we want you to close the greatest of all the outlets." Therefore, I would say that as to this modified outlet theory which has been proposed, experiment though it may be, it has been demonstrated that, with crevasse outlets, together with the Atchafalaya outlet, the flood level was lowered, and that if a modified outlet is established for use in emergencies it will be further lowered. It would seem to me that if you gentlemen direct the use of such modified outlets as that, the worst that could happen would be that they would not do the work. The worst that could happen would be that they would not lower the flood level to the extent the proponents of the spillways claim. But, on the other hand, there is not any relief in the all-levee system, with a higher and higher flood level over all levees. If the outlets fail, the failure can not be any more disastrous than the failure of the all-levee system. It would therefore seem to me, from the larger aspects of the question, basing myself upon data which experts furnish—it would seem to me to be a reasonable conclusion that these modified outlets should be established, particularly as the great natural outlet of the Atchafalaya has been approved, practically approved, by the engineering department of the Government.

Mr. CURRY. The engineering department of the Government in the past has been considerably hampered because of the limitations of the law. Now, in enacting another law, do you think we should be specific or enact a law that will be elastic?

Mr. CAFFERY. There must be elasticity. The problem can not be handled in a strait-jacket. But I feel that, in so far as the engineers now in charge of the river are concerned, they are committed altogether to a theory which excludes anything like an outlet, or anything like a spillway, and, in so far as the lower reaches of the river are concerned, it may not be unworkable to provide that this commission shall have a coordinate jurisdiction with some local State body, that the President shall appoint upon this commission for that particular local jurisdiction some local appointees.

Mr. FOSTER. May I ask you this question: You have State engineers in Louisiana?

Mr. CAFFERY. Yes, sir.

Mr. FOSTER. Now, do the State engineers differ with the Federal Government engineers with reference to work which should be done along the Mississippi River?

Mr. CAFFERY. No, sir; the whole engineering profession seems to have united on the theory that the only way to handle the river problem is by levees only, and there are only a few engineers who take the other view. The undoubted weight of engineering authority is that we must rely solely upon levees.

Mr. FOSTER. I just want to ask this with reference to the Atchafalaya: Your idea, as you have expressed it here—if I am not right you may say so—is that the Atchafalaya should not be closed, but that levees should be built up sufficiently strong along the Atchafalaya to hold whatever flood may go down through it. Is that right?

Mr. CAFFERY. No; I can not say that, because I do not think that can be done all over the Atchafalaya country. I say that, as far as practical, levees should be built so as to protect the Atchafalaya country from the damage done by raising the flood height. And in that connection I want to say that, in answer to one of the questions from the chairman, I believe, it was stated that the Atchafalaya country would be overflowed anyhow whether this flood came down heightened or not. I did not exactly state the conditions there. Most of the Atchafalaya country would be overflowed anyhow. Most of the Atchafalaya country is merely swamp and is better off overflowed, as matters stand. But the heightened floods throw the waters on land which they would not otherwise reach. Properties have been overflowed since this rise in the flood level that were overflowed only occasionally before.

Mr. FOSTER. How would you overcome that?

Mr. CAFFERY. Well, the levees on the Atchafalaya would overcome that to a very large extent.

Mr. CURRY. Do you think in framing this bill, if there were a provision in it authorizing the engineers to do "anything necessary to maintain the navigability of the river and protect the lands from overflow," it would be better than to be more specific?

Mr. CAFFERY. If you do not institute some general supervisory or coordinating board—

Mr. CURRY (interposing). I am talking about the agency that may be created by this committee to do this work.

Mr. CAFFERY. I think the problem ought really to be put in the hands of somebody such as a general commission, or such as a Cabinet officer, if necessary, a special Cabinet department. I really think that would be the best way to handle this problem.

The CHAIRMAN. You think we ought to have a commission which, in determining the methods by which the various flood situations in the country can be controlled and remedied, would not be governed by the great weight of engineering authority?

Mr. CAFFERY. A commission that would be independent enough to act against the great weight of engineering authority if the ascertained data was such as to justify logically their acting against the data that the engineering authority had furnished.

The CHAIRMAN. Exactly.

Mr. CURRY. Congress can not delegate its legislative authority.

Mr. CAFFERY. It can go very far in that direction. It can not delegate it, but it can adopt a legislative policy and leave it to the officer or board to carry out that policy, and what I propose here would certainly be in line with the decisions on that point. The Secretary of Agriculture has been authorized to adopt regulations for purposes of forest conservation and things of that kind, and he has adopted a book of regulations, and it has been held by the Supreme Court that that book is law.

Mr. CURRY. That is not definite authority which is vested in the Secretary of Agriculture. I know of one or two cases where he tried to exceed his authority, and I personally stopped that.

Mr. CAFFERY. I imagine in those regulations there are exceedings of his authority, but as a general thing it has been found necessary

to authorize an administrative officer to carry out the large views of the legislative department.

Mr. CURRY. But his activities are limited.

Mr. CAFFERY. Congress can declare a policy and leave it to the board or officer to carry out that policy.

The CHAIRMAN. It is 4 o'clock, gentlemen, and to-morrow we have some gentlemen who have come all the way from California to be here, and we can not therefore consider continuing this hearing on this particular proposition continuously. Now we may, at some later date, if that is satisfactory to you, come back and continue this hearing, but I just make that suggestion to you now.

Mr. CAFFERY. As for myself, I will say that I have covered the subject generally about as fully as I desire. I would not want to encroach further upon your time, and want to thank you for your attention.

Senator NEWLANDS. I want to ask whether I could have about 15 minutes before you adjourn?

The CHAIRMAN. Certainly.

Mr. HUSTED. Mr. Caffery, I would like to ask you a question, if I may. Your objection to closing the Atchafalaya is, of course, because you think that the closing will increase the flood danger to the country on the Mississippi below the Atchafalaya?

Mr. CAFFERY. The lands on the Mississippi River below the mouth of the Atchafalaya; yes, sir.

Mr. HUSTED. Now, assuming that it would cost fifty millions to levee the Atchafalaya, and it would cost, say, seven millions to so strengthen the levees below the Atchafalaya on the Mississippi as to make them safe, just as safe as they are at the present time against any increase of head, due to the closing of the Atchafalaya, would you then think that it would be a better proposition to spend \$7,000,000 in strengthening those levees than to spend \$50,000,000 in strengthening the levees on the Atchafalaya?

Mr. CAFFERY. I think it would be better to spend \$7,000,000 on the Mississippi.

Mr. HUSTED. I want to read some excerpts from the testimony:

Question. If the divorcement of the two streams were made and the levees below the Atchafalaya on the Mississippi River were strengthened and raised sufficiently to accommodate the additional flood water, would the flood danger to the country bordering the Mississippi below the Atchafalaya be greatly enhanced?

Col. TOWNSEND. Only so much as every increased height in a crevasse is more dangerous. Of course, as your levees increase in height, while the levee may be as safe or even safer, if a flood occurs, the disaster which results is going to be so much greater because of the increase head that occurs from raising the flood height.

Question. As levees are raised, do not elements of control enter into the problem which can not be altogether offset by the strengthening of the levee, by widening its base and by taking the usual means which you do take to protect the country against floods?

Col. TOWNSEND. I will answer that yes and no. If you make a levee that is of suitable width and suitable dimensions for the increased height, I think you are as safe with a high levee as with a low one. But the difficulty is as you increase your head, the increase is as the cube of the height.

Question. Is not the practical height of a levee limited?

Col. TOWNSEND. No, sir; I do not think it is. The Gatun Dam is nothing but a levee 85 feet high.

Question. But what I mean is, assuming the conditions as they exist on the Mississippi River, taking into consideration the nature of the foundation, the character of the soil, the tendency of the pressure of the river to force the water under the levees—taking all those elements into consideration, is not the practical height of the levee limited?

Col. TOWNSEND. No, sir; we have built levees 50 feet high on the Mississippi River.

Now, in view of that testimony of the president of the commission, which is quite flatfooted upon the proposition that a high levee is just as safe as a low levee and that it will cost only seven millions to strengthen the levee below the mouth of the Atchafalaya and make it just as strong and give just as much protection as now to the city of New Orleans and other cities on the river below the mouth of the Atchafalaya, do you think it would be a better proposition to spend seven millions on that than for the Government to spend fifty millions in putting levees on the Atchafalaya River—since the expenditure of this \$7,000,000 will give the country in the Atchafalaya district just as much protection, or perhaps more, than the building of levees on the Atchafalaya at a cost of \$50,000,000 would?

Mr. CAFFERY. When an engineer suggests the building of a 50-foot levee on the quicksands of lower Louisiana and the use of dams like the Gatun Dam on such quicksands, it reminds me of what Frederick the Great said—that the best and surest way to ruin a province or principality was by appointing a doctrinaire to govern it. When that statement is made, it is made in utter disregard of local conditions. It is very true that you can build a levee 50 feet high. It is very true that you can construct a Gatun Dam, but Col. Townsend would not dare put one in the district below the Red River unless he would build a Gatun Dam under the dam, and then there would be a question as to the safety of it.

The CHAIRMAN. There is no question, as I gather it now, that you are opposed to the divorcement of the Atchafalaya and the Mississippi Rivers?

Mr. CAFFERY. I would not want to say that, Mr. Chairman. I think we are going to come to that in the future, but I do not think it is a practical thing to talk about it now.

Mr. WILSON. In addition to the thirty or forty millions dollars that would be saved as indicated in Mr. Husted's question by the closing of the Atchafalaya, would there not be the additional advantage that it would reclaim those millions of acres in the Red River basin?

Mr. CAFFERY. Yes; that would be a consideration; but I think the local lands ought to pay a just pro rata.

Mr. KEARNS. Was Col. Townsend's answer based on the fact that he was going to close the mouth of the Atchafalaya?

Mr. HUSTED. Yes.

The CHAIRMAN. I would like to read a few brief excerpts. In the course of Mr. Parker's remarks I suggested that not even Mr. Maxwell would claim that impeding reservoirs were new to the engineering corps of the Army. Mr. Maxwell took issue with me sharply and with some emphasis on that proposition, and said that as a matter of fact they had declared it ridiculous. I have here a report, which, by the way, was the second report made by the engineers of the Army on the floods of the Ohio River in 1914—made to Mr. Garrison.

Summarizing what the engineers had stated, Mr. Garrison, in his report, says:

2. Reservoirs, both storage and impeding, may be used to advantage in certain localities, especially on the smaller streams and where good reservoir sites are obtainable at reasonable cost.

Then the report of the board goes on to say:

Since its organization the board or its committees have visited 66 places, have passed upon plans submitted by municipal authorities for Columbus, Lima, and Toledo, and has now under consideration plans for Fort Wayne, Ind.

I was thoroughly familiar with this report when I made the suggestion yesterday.

Another matter. The board said:

The board has reached the decided conclusion that no one method of flood control can be recommended to the exclusion of others. Local conditions vary so greatly between several basins that what is suitable to one stream is likely to be unsuitable for another. In some places (as at Dayton) reservoirs appear to promise good results. The board is informed that this method has been recommended by the engineers employed by the city. In others (as Columbus) a system of levees and increased dimensions with a cut-off is preferred.

Still further there is a report at length on impeding reservoirs, to which I referred:

Impeding reservoirs: The reservoirs called by this name are automatic, having discharge channels, always open, so proportioned that the greatest flow through them, under the greatest head possible, will not exceed the carrying capacity of the stream below. They have been used to a limited extent in Germany, and have been considered in conjunction with other methods as a means of flood control at Columbus, Ohio, where, as the board believes, the combined system would have been successful. They have the advantage that their usefulness as flood preventers can not be diminished by other more or less incompatible uses. But they have the disadvantage that they do not give full control of the discharge, especially with respect to phenomena of interference with other streams. From an economic standpoint, as compared with storage reservoirs, they allow a great deal of valuable water to run to waste.

And, then, still another recommendation of the board I will read here, which I think will be interesting:

It therefore clearly appears that a great deal of work remains to be done. This work should be done progressively and systematically and a beginning should be made with the tributaries. The problem of the Ohio itself can not be adequately treated until some method of flood control has been adopted for the tributary streams. No further progress can be made without actual prosecution of work in the field, and the board recommends that this be undertaken as soon as possible. The following tentative program of operation is recommended.

Then follows his tentative report, and he says that the board is anxious to have authority to proceed. I stated that I would put into the record a statement of the engineers to go along with Mr. Maxwell's statement to show that these dams were not new to the board of engineers. It is a matter that they had heard of before.

Mr. MAXWELL. I did refer to that report in my remarks, and at a later time I would like two or three minutes to explain my statement.

The CHAIRMAN. You suggested it was new, and that the Army engineers said that it was ridiculous.

Mr. MAXWELL. The question was—what I referred to as ridiculous was the statement given out by Col. Bixby, which was before that report was made from which you have read. Col. Bixby's statement was immediately on the heels of the Dayton flood.

**STATEMENT OF HON. FRANCIS G. NEWLANDS, UNITED STATES
SENATOR FROM NEVADA.**

Senator NEWLANDS. The question has come up as to the method of organizing this work. I assume that the purpose of Congress now is to adopt a broad legislative policy, regarding the mitigation of floods and the putting of flood waters to some useful purpose, and that its purpose is to secure as perfect an organization for carrying out that legislative policy as can be conceived, and that it is disposed to enter upon this work in such a way as to secure continuity and to secure fair dealing with the various watersheds of the country, so that no one watershed can say that its claims are not being disposed of in their turn.

The CHAIRMAN. I think that is the purpose of this committee, Senator.

Senator NEWLANDS. Now, it is very clear that in entering upon this work we must realize that it is a big work, and that it is going to take a very large sum of money—a larger sum than has ever yet been appropriated for any work of internal improvement, and that its value warrants large appropriations, and that the safe conduct of this legislative policy requires continuity of purpose and continuity of work.

We have realized in the past that continuity is a most important thing. For instance, years ago Congress declared that it was important that the banks of the Missouri River between its mouth and Kansas City should be reveted. There was a vast plain of alluvial deposits of incomparable richness through which this violent stream was forcing itself in the most fitful way, just as it would be if you should propel a tremendous force of water against sugar, so that the farm of to-day that was on the left-hand side of the stream might to-morrow be on the right hand, or it might be entirely destroyed. Now, Congress commenced to appropriate, but it got tired. Considerations of economy intervened. Inertia intervened and the work was abandoned, and yet if you go to this Missouri River to-day you will find a space of considerable distance—I forget how much, a hundred miles or so—from the mouth which was reveted many years ago, perfect to-day and the bank entirely secure.

The CHAIRMAN. And the channel kept deep and free from obstruction.

Senator NEWLANDS. Now, that work was abandoned. I can't attach blame to anybody in particular. I do not know who was responsible for it. Probably inertia was responsible for it, and the absence of a fixed determination on the part of the Congress to see that the work provided for was to be completed. Now, recently, Senator Stone of Missouri, who was formerly a colleague of mine upon the Commerce Committee of the Senate, became very urgent in the restoration of that work. He met with great opposition in the committee. He had worked upon that matter three, four, or five years. The very fact that the work had been abandoned convinced the members of the committee that it ought to have been abandoned, and it required tremendous effort upon his part to get an appropriation of \$1,000,000, I believe it was, a year, which he has secured for the past two or three years. He told me that the engineer officer

who was deputed to carry out this work was entirely in sympathy with it, and was prosecuting it diligently and well. But when his shift came he was changed to another district and an engineering officer from the East came in his place, and his recent recommendation is that the work should be abandoned; and Mr. Stone is now compelled to meet that situation.

The CHAIRMAN. The board of engineers that reviewed that finding reversed that engineer.

Senator NEWLANDS. I was not informed as to that, but it shows the exigencies to which these things are subjected through the varying judgment of officials who are placed in charge of these important works.

Now, when we entered upon the irrigation work, after a 10-year agitation, in which we found it very difficult to bring Congress generally to a realization of the importance of the problem and the largeness of the problem, I finally introduced a bill that provided a fund from the sale of public lands and gave the Interior Department absolutely control over the whole question. The determination of projects, their extent, the commencement of the work, the prosecution of the work was left under its control, the only limitation being that no contract for work should ever be made unless the money to pay for the work was in the fund. And now under that fund \$80,000,000 worth of work has been done. It is a revolving fund, and, as the water rights to these reclaimed lands are paid for by the settlers, the money is paid out for the construction of new work. I have not the slightest doubt if we had not provided in that way the fund for consecutive work, that work would have been abandoned, just as the Missouri River was.

I recall that Mr. Roosevelt became greatly interested in the irrigation problem. He was a western man and had lived in a somewhat arid State and was interested in the problem. He told me he was interested in it, but he said, "You have got too big a bill; you can never pass it. The only way to do is to have a bill for a single project involving an expenditure of not more than a million dollars and get that in as an entering wedge, and then the Government, having entered upon this work, will probably prosecute it further." I said, "Mr. President, I can not afford to risk this great legislative and public policy upon a single project. The engineers may be mistaken in their location, may be mistaken in their estimates, and a single error or mistake might put in peril the entire policy and put back this great public work indefinitely." I said that I considered that the provision for continuous work, which the creation of this fund involved, was absolutely essential to this bill, and that so far as I was concerned, I would never abandon it. He yielded to that suggestion and threw himself behind that bill, and the bill passed, thoroughly nonpartisan in character, for, although that was a Republican House, the majority votes secured for the bill were Democratic. We could not have passed it, probably, without Mr. Roosevelt's active intervention in the matter.

Mr. CLINE. How much was involved in that bill?

Senator NEWLANDS. It simply dedicated to this fund all the proceeds out of the sale of public lands, which were then aggregating about \$6,000,000 a year.

Mr. FOSTER. You provided at that time that those funds derived from the sale of public lands should go into this fund and be used over and over?

Senator NEWLANDS. Yes; to be used over and over.

Mr. FOSTER. Now, sir, we have a different situation in the bill we have here.

Senator NEWLANDS. I realize that. Now, when we came to the question of rivers, in which I became greatly interested, the commission that was appointed consisted of two Senators, two Representatives, Messrs. Burton and Bankhead being the Representatives and Senators Warner and myself being the Senators. We took up this whole question, and you will find it in the report signed by Mr. Burton. We all agreed that there must be a large fund for continuous work. We all agreed that there must be coordination in the services that were engaged in these various problems relating to water; that there should be cooperation between the States. And those principles I embodied in this bill, which has been introduced by Mr. Rainey in the House, and which Mr. Broussard previously fathered in the House and I fathered in the Senate.

Now, the Democratic platform explicitly calls for a large fund for continuous work. It declares for coordination of these various services, and it declares for cooperation with the States. There is nothing in this bill that is not in our platform—in the Democratic platform. The Republican platform was not so specific, but it was broad and general and will justify such legislation as is contained in this bill.

The **CHAIRMAN.** And so is the Progressive platform.

Senator NEWLANDS. And so is the Progressive platform. Now, when we came to this administration Mr. Wilson took an interest in it just as Mr. Roosevelt had. And I may say that Mr. Taft, when he was Secretary of War, made a report covering favorably all the provisions of this bill, but not committing himself as to the fund, but insisting upon it that there should be ample provision for continuous work. When Mr. Wilson's administration came in he manifested great interest in this subject. But, of course, very shortly after he came in we were subjected to embarrassment arising from the Mexican situation and the European situation. The question of finances became an important matter, but he appointed a departmental committee, consisting of the Secretaries of the Interior, War, Commerce, and Agriculture, and asked them to look into the matter thoroughly and report to him. They did so and made a report in favor of coordination and cooperation of the commission. I believe, however, that was more in the nature of a verbal report than a written one.

Recently, when this flood in Mississippi accentuated the question, a telegram was received from Mr. Walter Parker, general manager of the Association of Commerce of New Orleans, calling attention to the pledges of the party and the necessity of this great work. Mr. Wilson again referred the matter to this departmental committee, the office of the Secretary of War being vacant. Messrs. Lane, Houston, and Redfield met and came into communication with Senator Ransdell, Senator Broussard, and myself. They asked Mr. Humphreys to attend the conference, but unfortunately he was

ill at the time. We reviewed the whole matter in two or three conferences, and then they drew up a written report to the President and I received to-day a letter from the President containing this report.

I understood from one of the members of the Cabinet that the report was read at the Cabinet meeting and was approved, but there is nothing in Mr. Wilson's letter to indicate his individual views. I will read the letter and the report.

(The letter and report were read as follows:)

THE WHITE HOUSE,
Washington, April 3, 1916.

MY DEAR SENATOR: I take the liberty of sending you inclosed a copy of a memorandum concerning flood control which the Secretaries of the Interior, of Agriculture, and of Commerce were kind enough to prepare for me. I hope that it will prove of interest to you. I know that you were consulted at the time the memorandum was contemplated.

Sincerely, yours,

(Signed)

WOODROW WILSON.

HON. FRANCIS G. NEWLANDS,
United States Senate.

THE SECRETARY OF THE INTERIOR,
February 26, 1916.

MY DEAR MR. PRESIDENT: In accordance with your suggestion, we beg to present a résumé of our views as to the practicable way of dealing with the problem of so regulating and handling our rivers that they will be made to be of greater use and of less injury to the nation.

We do not feel the necessity for emphasizing the need for such legislation. Each recurring year makes plain the greatness of the work that must be undertaken if we are to keep our rivers within their banks. The floods of each year take their toll in property and lives. Our streams are filling with silt and their channels becoming less certain and reliable as nature's primal highways. Vast bodies of lands of the richest alluvial character are submerged so large a portion of the time as to be of no value to the nation and of no service to the world. Therefore, to make more navigable our streams, to protect the cities and farms already established and to make a place for others, to save life and increase our crops, to conserve the waters on the higher reaches of the streams where they may be used for needed irrigation, and to convert their fall into electric power—these are the chief ends to be reached by river improvement.

It is time, we believe, to urge a comprehensive and constructive plan of river development upon Congress, a plan which recognizes the magnitude of the problem, the impossibility of dealing with it by temporary expedients, and that looks definitely to the time when the flood evils of to-day will be remedied and the waters put to their highest use. This means nothing less than a study under one responsible authority of the problems and possibilities of each river, and after such study a determination upon a definite policy with regard to it, and the commitment of the Government to the pursuit of such policy. It has been suggested that an adequate lump sum and continuing fund for carrying on such national work shall be placed in the hands of a commission composed of the President and four of his Cabinet, which fund shall be expended upon such projects as it sees fit. We do not think this plan in its logical entirety necessary to the end in view.

I felt that the Secretaries were convinced that it was desirable. They felt that Congress would be unwilling to do so.

We do believe, however, that the Congress should commit itself to a comprehensive policy of river development, involving the expenditure over a long period of a large sum of money, with sufficient appropriations immediately available for continuing the work on the lower Mississippi substantially in accordance with the plans of the Mississippi River Commission, and for taking the necessary preliminary steps for the study of problems and the projection

f work on other parts of the Mississippi and on other rivers. It should study each river system, and as projects are developed reports with recommendations or expenditure should be made to Congress with the understanding that Congress, on the basis of the data furnished, would provide sufficient sums for the continuous prosecution of the work. There are precedents for this course, such as the Panama Canal and the Alaskan railroad projects. In these cases Congress determined that such enterprises should be undertaken along the general lines of development, and in a sense pledged itself to award the money necessary for the completion of the enterprise within a limited time, leaving the details of the plans and their execution to executive bodies.

I think there were very few details regarding the Panama Canal. My recollection was that our first appropriation was about \$50,000,000, upon the assumption that the canal would not cost more than a hundred million or a hundred and fifty million. Details of the construction were left to the Panama Canal Commission, the legislative policy declared the details left to the commission, and the money supplied from time to time.

We believe that for the execution of such a policy the Congress should authorize a national waterways council, composed of the President and the four heads of departments most concerned, War, Interior, Agriculture, and Commerce—

Those being the departments which have to do with the various services that relate to water, the development of the water, the use of the water, and the control of the water—

and a subordinate water-control board composed of a highly qualified representative from each of the four departments, and of such engineers or other officials as the Congress may authorize. The four department representatives of the latter board should have such standing in the departments and such functions as would enable them to secure such data and services in connection with the work from the various bureaus in the departments as may be serviceable and necessary. The national waterways council should be authorized to direct and control the general policy and procedure of the water-control board and other agencies charged with the execution of the work, to establish the necessary rules and regulations, to consider and approve plans, the distribution of funds under authorization from Congress, to decide questions of conflict, and to report to Congress. The latter board should be authorized to coordinate and invoke the services of the necessary bureaus and agencies of the Government, to make preliminary surveys and detailed plans for work in various areas, to prepare estimates, to study the activities of the States, municipalities, organizations, and individuals in water regulation, to prepare a general program of water and waterways regulation and development involving the combined resources and cooperation of all the agencies, to recommend to the council for approval the assignments for the different bureaus or services of the departments, to complete statements of the work already accomplished, and immediately to supervise the prosecution of the work under the plans approved. It would be understood that in the meantime there should be no interference with the execution of the existing plans of the Mississippi River Commission for the work on the lower Mississippi, and that these plans should proceed as outlined unless it should become clear that improvements could be made.

The most pressing call for help has come, and continues to come from the lower Mississippi. As to this river what may be determined defensive plans have been elaborated by the eminent body of national officials who are now prepared to proceed with their work to its completion. Their embarrassment arose out of the fact that they can not plan for the execution of their work continuously and for a sufficiently long period, owing to the fact that each year the work must wait on the appropriations for that year. There would seem to be every reason for prosecuting these plans vigorously, and later as investigations proceed for supplementing these works with others of a constructive nature higher up the river, and for undertaking as soon as possible projects on other rivers.

To summarize, we recommend:

1. That Congress declare its purpose to deal with our river problems in a comprehensive way, involving a large ultimate expenditure of funds and the immediate expenditure of considerable amounts, and the creation of machinery intimately related to the executive branch of the Government.

2. That the boards and the other parts of the machinery provided for shall be directed to continue the work on the lower Mississippi substantially under existing plans, and to proceed with the investigations and the elaboration of plans on other parts of the Mississippi River and other rivers of the Nation.

3. That all the available agencies of the Government shall be coordinated in this endeavor to improve and protect our rivers, to control floods, to utilize waters, and to reclaim valuable lands and make the necessary reports to Congress as bases for additional appropriations.

4. That the expenditures for this work should, in the main, be met by the sale of national bonds, and that the lands benefited should be made to bear a proportion of such expenses, agreements in this regard to be submitted to the Congress as part of the plan for development.

Cordially, yours,

FRANKLIN K. LANE.

D. F. HOUSTON.

WILLIAM C. REDFIELD.

The PRESIDENT, *White House*.

Now I wish to say that the creation of a fund seems to me to be very desirable, even though you do not name the amount that is to go into the fund. And that you should provide that not only moneys put by Congress through the Treasury into that fund should go to that fund, but that all the money received from the development of water power, from reclamation of swamp lands, and from the reclamation of arid lands should also go into that fund so that it would be conducted as a business enterprise, showing, on the one hand, receipts from the Federal Treasury, the receipts from those contributory sources, and on the other hand, the actual expenditures made. It should be conducted as an absolutely individualized product.

Mr. RUSSELL. You would make the passing of the law provide for bonds?

Senator NEWLANDS. Well, I think that is a matter I should approve. I should approve myself a considerable increase in taxation in order to cover this question of interior development, and I believe the public will sustain such an increase.

Now there is just one other thing that I wish to say, and that is this: In the Senate particularly, I feel that it is important, from my knowledge of the Senate, and the sentiment there, that this bill should be comprehensive and should embrace every section of the country. It should embrace every watershed in the country. Of course, the relative importance of the projects will be considered in the first place by this commission or council and will be determined by Congress.

The CHAIRMAN. May I ask a question? You say it should embrace every watershed in the country. You mean by that that machinery should be created by which every watershed in the country can be examined and reported upon?

Senator NEWLANDS. Yes; surveyed and reported upon, and the projects actually entered upon.

Mr. HUSTED. Do I understand you to say, Senator, that under this proposed bill no expenditures would be made for works or improvements on rivers until a report had been made to Congress by the commission appointed by the act?

Senator NEWLANDS. No; the bill itself would have to be modified in order to accomplish that. The bill as introduced provides this fund of sixty million dollars annually, apportions it to the various water districts, ten millions to one district, five millions to another district, and then permits this commission to go along and carry out the national policy and its own. But I am satisfied that it is not the temper of Congress and, as far as that goes, I yield, but very reluctantly, to the suggestion that these projects should be entered upon only as approved by Congress.

Mr. HUSTED. In that respect the report differs from your bill.

Senator NEWLANDS. Now, another thing and I will close my statement; I refer to this coordination of services. The engineers of the Army seem to have an idea that this involves their jurisdiction and takes something from them. On the contrary, it is going to give them larger work than ever. It does not take away any of the work they have at present, but there are other coordinating services that are doing work on the river. The Reclamation Service is doing work, and can do much more work in diverting the flood waters over the arid plains. We would expect, of course, that the work would be done by the Reclamation Service. Then, if we should enter upon a policy of reforestation we would have, already organized, an Appalachian Commission, consisting of Senators and Representatives and others, members of the executive body, and they are purchasing lands in the White Mountains and Appalachian Mountains and have already spent nearly eleven million dollars for that purpose. Now, we would expect, so far as the purchase of land is concerned, for the commission to go on with its work as coordinated with other bureaus and services under this general council. Also, the Agricultural Department has its drainage service. It has been paying great attention to swamp-land reclamation. Any work that will relate to that will, of course, have to be done either through that service or with its cooperation, because that service has an accumulated experience.

Take the question of fisheries. There is no doubt that we could vastly increase the food supply of the United States by proper attention to the fisheries of the rivers. We would expect the coordination of that bureau.

These things do not take away anything from the Engineering Corps of the Army, because they haven't now any jurisdiction over those cases, in which we simply create them a coordinating service, which will simply bring the Army Engineers into coordination with these various departments, where it would be serviceable to them.

Now, as to water. Here we have this problem of water, drunk up from the ocean, carried by the clouds over this vast continental area, and dropped on the earth, with no system of control, and the question is, When shall we conclude to control that water? After it has already become a liability, after it has already reached such proportions in volume that its force is destructive? Or shall we take hold of it as soon as we can after it falls from the heavens and put it to beneficial use?

We may find extraordinary compensations in these beneficial uses. If we allow the present processes to go on, we will have continuous losses from floods. If we want to hurry the water on to the ocean, all we have got to do is to cover the entire Mississippi watershed with concrete, and we will have it rushing down upon New Orleans with

tremendous speed and velocity, and New Orleans would be destroyed. Shall we not go to the other extreme of putting every possible obstruction to the flow of that water from the time it falls on the earth to the time it empties into the Gulf? It is a simple process of slowing it down, thus diminishing the flood level below and overcoming to that extent the necessity of ever increasing these levees.

Now, these uses are beneficial and obvious. You have had them pointed out to you by the engineer from Chicago, Mr. Lyman E. Cooley, the other day, and I will not amplify them. He did not, however, refer very particularly to the arid region. The arid region is the source of many contributory streams to the Mississippi. There is the Missouri River, with all its tributaries, the Yellowstone, the Jefferson, the Madison, and the Platte, and many others, constantly pouring their snow waters into the Mississippi. Just to the extent that you can hold back those waters and keep them on the arid plains, just to that extent you lessen the flood level below and decrease the cost of control there. So it is with the valleys that Mr. Maxwell referred to north of the Ohio River and south of the Ohio River, and so it is with the Arkansas, which takes its source in Colorado and flows through Kansas. So it is with the Colorado River itself, which has its sources, I believe, in about five States. The attention to the problems above, the storage of this water, the beneficial use of this water, stops its progress and lowers the flood level below and lessens the flood dangers. Almost all of these rivers have their sources in from three to five States, and it is an interstate, a national question.

I had hoped that the committee would conclude to look at this thing in a very big way. I have no doubt that it has this disposition.

Something has been said as to whether a commission can do its work better than a committee of Congress. Why, no; the commission can not do the work of legislation as well as the committee of Congress, but there is not a Congressman on this committee, there is not a Senator on a similar committee in the Senate, who is not weighed down with other duties besides the duties of this committee, and this committee can not be all the time in session throughout the year. It is formed for legislative work and not executive work. The advantage of this plan is that it centralizes all this work as the Constitution centralizes it—in the Executive Department, the President—making him the source of all power in executive work. Putting him at the head of this commission and holding him responsible, I can not imagine any work that will be conducted with such anxious care and solicitude as this work will be if you charge directly the Executive Chief with the responsibility for it and give him the machinery by which he can carry it through.

Mr. FOSTER. Senator, in the Panama Canal, which was largely under the War Department with a commission, and with the Alaskan Railroad, which is under the Secretary of the Interior, is it your judgment that these four Cabinet officers, together with the President—is it your opinion that a commission of these officers, who are usually about as busy as a Member of Congress, can look after that as well as a commission of a small number would be able to do it?

Senator NEWLANDS. Well, you mean a commission of experts?

Mr. FOSTER. Yes.

Senator NEWLANDS. Well, my answer is that I think it is of the highest importance that the President himself should know in a

general way about the great work which is being carried on during his administration.

Mr. FOSTER. I think that is true.

Senator NEWLANDS. That keeps him in touch with the entire organization, just as it does the president of a great railway system, who is not overburdened with work because the great organization under him is so complete that it does not overtax him. The reason for having this commission composed of Cabinet officers is that there are about 10 different services that are interested in the development of water and its control, and they are distributed among four departments—the Department of War, the Department of the Interior, Department of Commerce, and Agricultural Department. Now, then, the only way you can get team work, therefore, on the part of these departments—the coordination of these forces, of these plans and works—is through this executive head.

Mr. RUSSELL. You would have the President appoint this other board that is to act under them?

Senator NEWLANDS. Yes; I should have the President appoint them—that is, upon the recommendation of this commission or without it. The bill which I have been urging provides that the chiefs of the various services shall constitute the regulation board under the commission—that is to say, the Chief of Engineers, the Chief of Reclamation Service, the Chief of the Forestry Service, the Chief of the Drainage Service, the Chief of the Coast and Geodetic Survey, the Chief of the Geological Survey. It is suggested by the department chiefs in place of that that there should be an assistant secretary of some kind appointed in each one of these four departments with special knowledge and skill in all of these things, but all four of them together should constitute this regulating board, reinforced by such engineers and experts as Congress may see fit to provide for. The most eminent engineers and constructors could be added to it.

Mr. FOSTER. In the Panama Canal we had a commission with one man who has charge of that work. We have in Alaska the same condition. Now, in this work, while we have these coordinating branches, yet would this work be under the one head if a bill like this becomes a law?

Senator NEWLANDS. The work assigned to engineers would be under the Chief of Engineers. The lower Mississippi would be under the Mississippi River Commission. It would be under that commission, but it would be subject ultimately to the direction of the waterways council of these four department chiefs, together with the President.

Mr. RUSSELL. Is there danger of these four men selected from the Reclamation Service and so on changing so fast as to endanger the efficiency of the board? They are not permanent. They are in four years.

Senator NEWLANDS. The chiefs of the scientific service are generally not subject to political exigency. We never hear of the Chief of the Geological Survey being changed with the administration, nor the Chief of the Reclamation Service, nor the Chief of the Engineers.

Mr. RUSSELL. No; but I thought that the heads of these drainage and reclamation services did change with the service.

Senator NEWLANDS. I think not.

Mr. RUSSELL. It seems that such a board should be as permanent as possible.

Senator NEWLANDS. That is a detail to be considered by the committee.

Mr. CURRY. Which one of the executive departments makes the report and estimate to Congress?

Senator NEWLANDS. The report will be made by the national council through the President. It will be made directly by the President. He is the chief of the board.

Mr. CURRY. Directly from the President to Congress?

Senator NEWLANDS. Yes.

Mr. CURRY. You mentioned the Alaska Railroad. You remember that that bill authorized the expenditure of a definite estimated sum of money.

Senator NEWLANDS. Thirty-five millions.

Mr. CURRY. I was the subcommittee of one that made that estimate and put in the provision that they must report to Congress the expenditure of money and the estimates of the succeeding year's expenditures.

Senator NEWLANDS. I think that is a very wise provision. I understand here the purpose in the bill as I introduced it was not to deprive Congress of any jurisdiction. I wanted the reports, investigations, and everything of that kind. But I was particularly solicitous about continuous work. I was afraid about changes of policy in bad times.

The CHAIRMAN. If I get your idea, the main thought is that when we undertake to go into a watershed, the examination that is made by the agency selected ought to be comprehensive enough to take into consideration all the beneficial uses that the waters in this shed can be economically turned to, and not, as has been in the past, be confined solely to the one interest of navigation.

Senator NEWLANDS. That is right.

The CHAIRMAN. And that there ought in the report to Congress, if necessary, wherever there are various institutions and uses that are found, be a plan suggested which contemplates a coordination of the various uses that that water can be put to?

Senator NEWLANDS. Yes.

The CHAIRMAN. If there is water power to be developed and floods to be controlled and navigation to be conserved, and whatever else may become involved, that that whole matter be taken into consideration by the agency that makes the examination, and a scheme worked out by which all of those interests can best be served and a general plan adopted.

Senator NEWLANDS. Yes; and that this council will have finally the adjusting of work, contemplating all of these various subordinate services in such a way as to secure the general treatment of the watershed in the most economical, most efficient, and most useful way.

The CHAIRMAN. Now, as to whether that is to be done by one commission or another is a matter of detail that has to be worked out. It is the general purpose to be conserved, and the end that is aimed at is to see that when we investigate a watershed for one purpose we investigate it for other purposes, with the hope in view that they can all be brought together in one class so as not to improve one at the expense of the other.

to overflow in Louisiana was necessary to accommodate this galaxy of spillways. In 1912 there were but three crevasses in the lines of public levee on the Mississippi River in Louisiana, causing the overflow of less than 20 per cent of the area embraced within the alluvial portions of the State subject to overflow. In 1913, though exceeding 1912 in flood level practically at all recorded stations on the Mississippi River, above the mouth of Red River, but recording at Carrollton, La., only 19.2 feet, there was but one crevasse in the lines of public levee on the Mississippi River in Louisiana, the overflow from which extended over less than 3 per cent of the alluvial lands of the State subject to overflow.

Does this tentative assumption of the effect of outlets or spillways in lowering flood levels at Carrollton, La.—6 feet between 1882 and 1912, and 4 feet between 1882 and 1913, respectively—admitting that it might prove in any way permanent, justify the toll in overflow that was paid in 1882? But one answer would be heard from one end of Louisiana to the other—No!

Again, not to go into the history of many others, which from time to time occupied attention and territory, what about the outlet or controlled spillway on the west bank of the Mississippi River, about 215 miles above New Orleans, from Point Breeze, the lower end of the levee system in the fifth Louisiana levee district, to Old River—8 miles wide, and, at high water, discharging at depths ranging from 10 to 50 feet, at a velocity of something like 5 miles an hour?

This spillway has been in operation from time immemorial. But what about flood levels at Red River Landing, just below? Gauge reading in 1882, 48.2 feet; in 1897, 50.20, and in 1912, 53.20 feet, respectively. And what about the toll—2,730 square miles of territory annually submerged?

What about the never-failing vis-à-vis spillways, one on each side of the Mississippi River about 100 miles below New Orleans, extending from the lower ends of the lines of public levee to the Head of the Passes, about 10 miles each in width, with ever recurring increasing flood levels with each succeeding extreme high water along that part of the river. And so on, ad libitum.

New methods of flood control on the lower Mississippi River may appeal forcibly to the theorist, but will never do so to the riparian dweller until he has first been given levees high enough, and broad enough, and well enough built to hold the surplus waters of the valley in the river and off of his property and improvements; after which theory and experiment may be safely permitted and indulged in without immediate risk.

To hold the water in the river and off of the lands and improvements of the State spells "levees," of such extent and dimensions and refinements as to place their ultimate enjoyment beyond anything like the resources of the riparian States. Aid must be had, and where but from the United States?

The board of State engineers thus continues to hope to at no distant day see the United States take over the control of the lower Mississippi River.

The continued conduct of Old River and the Atchafalaya River and the high waters visiting them and the Mississippi River during the past two years leads the board of State engineers to reiterate the direct opinion, expressed in its several previous biennial reports, that, provision being assured to satisfy any new conditions thereby imposed, the proposed separation should not be delayed any longer than can possibly be avoided.

A failure to ultimately effect the exclusion of the waters of the Mississippi River through Old River and the gap in the levee system above, from the lower Red River and the Atchafalaya River basins, must, from the point of view of protection from overflow, drainage, and reclamation, operate to an almost prohibitive degree against the successful development upon anything like comprehensive and economic lines of that section of the State.

In the dispatches from Washington appearing in the daily press here this morning Mr. Walter Parker is made to say as follows:

New Orleans has too much at stake to permit any change in the differential of safety that now exists between the levees at New Orleans and the average levee line. If the whole levee line from Cairo to the Gulf is brought up to the standard set by the engineers it will be necessary to make its levees very much stronger and higher than they are.

As a matter of fact, the city of New Orleans (Orleans levee district) as far back as 1907 adopted a grade and section for its levees

practically corresponding everywhere in all respects with the grade and section now recommended by the Mississippi River Commission, and materially exceeding it in cross-section along considerable parts of its lines, particularly on the east bank of the river, has steadily directed its efforts to accomplish this work, and has practically already reached a consummation of it. So that New Orleans has nothing to fear from raising and enlarging the lines of levee on the Mississippi River above or below it.

To disguise nothing, however, I will add that the bugbear which I think Mr. Parker had in his mind related to the wharves and sheds, for the benefit of commerce and shipping, so generously stretched—to its great credit and benefit—along the city front of New Orleans.

However, many of these structures—the greater number—are low as compared with the grades established for the levees. Why? Because they were deliberately constructed below a proper grade, though, at the time, advised by the board of State engineers that the grade prescribed for levees should be observed for the wharves and sheds as well.

Should the lines of levee above and below New Orleans therefore suffer in grade and section and be experimented with in spillways, reservoirs, etc., because New Orleans failed, at the proper time, to live up to a proper realization of the requirements of the situation?

Is it not far more just for New Orleans to be required, if necessary, to meet any new condition that may be imposed, rather than for the country at large, above and below, to sacrifice the integrity of its lines of defense to experiment a fancy?

As soon as ready for distribution, a copy of the report of the board of State engineers, to which reference is made, and from which the extracts given are taken, will be mailed to you and the members of your committee.

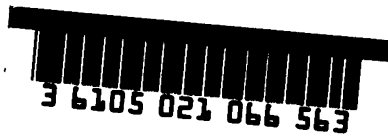
With high regard, and ever at your service, believe me, always.

Yours, truly,

FRANK M. KERR,
Chief State Engineer.

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